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CONTEXT AND CONNOTATIVE MEANING IN GRADE FIVE

by



PETER O. EVANECHKO

A THESIS

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CONTEXT AND CONNOTATIVE MEANING IN GRADE FIVE

submitted by

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in partial fulfilment of the requirements for the degree of
MASTER OF EDUCATION

ABSTRACT

This research was guided by the hypothesis, originally proposed by Whorf, that the variations in meaning of concepts generate differential views of reality -- Weltanschauung. It was hypothesized that the situational context within which words are learned and used constrains their meanings in certain respects and that the differences reflect diverse perceptions of the same sensual data as represented by language.

Osgood's Semantic Differential was employed to identify the position within semantic space of the same concept in: 1) a social studies context; 2) a literature context. Two different treatment groups of one-hundred fifty Ss each, comprising the total grade five enrollment in Leduc County, were required to rate ten concepts on twenty Semantic Differential scales. The treatments were designed to create a situational context for each group which was entirely natural as regards normal activities within that subject area. This included the administration of the instrument as part of the regular testing programs in each subject.

Factor structures defining the semantic space of concepts, taken together and singly, were compared to determine the nature of meaning and therefore reality in each context. These semantic structures were compared with

each other through the factor match procedure and to applicable findings from other studies.

The findings of the study are interpreted as supporting the conception of a differential world view as a result of differing meaning structures present in the various intra-language communities. Differences in global semantic structure were found to be of lesser magnitude, due to a regression of responses to the mean, than those of single concepts.

The investigation revealed that the social studies context produced concepts having greater intensity of connotative meaning. The breadth or meaningfulness of concepts was also somewhat greater in the social studies context. In both contexts, structure emerged in two categories: the principal dimensions of Evaluation, Activity, and Potency; and the secondary dimensions of Novelty, Stability, Security, and Tautness. Only the hypothesized shift in directionality of response in the different contexts did not appear; i.e., children tended to rate each concept towards the same end of each scale in both contexts.

It is suggested that the principal affective dimensions might be fundamental attributes of humans which are catalyzed by the secondary dimensions. These secondary dimensions appear to be largely unique to each context causing differing responses to occur.

It was judged that the results were sufficiently

supportive of the hypotheses to suggest replication of the study in order to determine whether other meaning structures exist, the effect of other independent variables, and the effectiveness of a practical application of these findings.

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CHAPTER I
INTRODUCTION TO THE PROBLEM
I. INTRODUCTION

"Human existence is welded to language" (Lotz in Saporta, 1961, p. 1). Language establishes society and makes culture and the accumulation of knowledge possible. The occurrence of socially determined behavior, which is cited as a mark of humanity, presupposes language.

In the study of the place of language in human culture and education most social scientists agree that:

... how a person behaves in a situation depends upon what the situation means or signifies to him. And most would also agree that one of the most important factors in social activity is meaning and change in meaning ... of cognitive and affective structures. (Osgood, 1957, p. 1).

Language not only characterizes all mankind but also divides it. Individuals in society become members of different language communities. Whorf (in Saporta, 1961, p. 465) concludes that each language embodies and perpetuates a particular world view. The speakers of a language are partners to an agreement to see and think of the world in a certain way -- not the only possible way. People also become members of different "intra-language communities" in their pursuit of knowledge and reality. These "intra-language communities" are comprised of language forms symbolizing and representing reality as seen

from the perspectives of different academic disciplines.

In the process of learning, the child is "molded" to perceive his world through the medium of the symbol system representing reality -- language. This symbolic process permits minds to communicate with other minds, and consciousness to communicate with itself as in the process of thinking. A principle which is axiomatic in this reference is, as Thoreau put it: "It is the man who determines what is said, not words." Thus we must look to the individual and the situation or context within which he uses language to determine what meaning concepts hold.

Allport (in Creelman, 1965, p. 17) suggests the basic significance of meaning for the individual in his assertion that personality itself:

... consists largely of meanings that are characteristic of a particular individual. Aside from purely automatic habits and reflexes there is scarcely any part of the whole field of behavior into which meaning does not enter.

The importance of the way an individual structures his world is seen in Asch's statement (Creelman, 1965, p. 17) that:

We act and choose on the basis of what we see, feel, and believe; meanings and values are part and parcel of our actions. When we are mistaken about things, we act in terms of our erroneous motives not in terms of things as they are.

Numerous attempts have been made to define meaning and subject it to quantitative measurement but considerably less effort has been expended in determining how meaning varies as a function of the situational context

and the syntax of the discipline within which language is used. The present study addressed itself to investigating the influence of language in certain contexts (school subject areas) upon the meaning of concepts and consequently perception of reality. Since the study was largely original in its theoretical assumption regarding the influence of context, it is generally exploratory and descriptive in nature.

II. STATEMENT OF THE PROBLEM

The study of the meaning of words is concerned with establishing the relationship of the words as signs or symbols to things, situations, and behaviors. Most specifically, the attempt is made to show the relationship of signs to that which they stand for, their significates. The study of word meaning is, therefore, concerned with the role of the organism in mediating the relation between sign and significate. According to the view of language as a mediational process "words represent things because they produce in human organisms some replica of the actual behavior towards these things, as a mediation process" (Osgood, 1957, p. 7). Words, as symbols, are able to represent reality and make necessary discriminations by virtue of the manner in which their meanings were learned. The contexts of the individual's learning history influence the representing property or meaning of the word, making meaning a function of learning and experience.

The greater majority of signs used in communication are assigns since their meanings are "assigned" to them by association with other signs. For example the word "zebra" may be given meaning by its association with symbols standing for animals with "zebra-like" qualities. Osgood (1957, p. 9) concludes that the meanings of assigns will vary "... since their representational process depends entirely upon the samples of other signs with which they occur." Meanings of words are learned and the situation (contexts) within which the learning occurs is instrumental in creating this meaning. Thus word meanings will vary with the context in which they are learned and used.

Affective or connotative meaning underlies denotative meaning attached to concepts in language and, therefore, structures the individual's perceptions of the referents or significates of these concepts. The "world view" of human beings can thus be said to be in part a function of their language. Any variation in word meaning for individuals will structure reality differently for them and is therefore an area of significant concern for educators.

To measure anything that goes on within the mind where meaning is generated it is necessary to use some observable output from it as an index. Linguistic encoding or ordinary intentional language can serve as the most efficient index of meaning since it is a measurable behavior (Osgood, 1957, p. 18).

The Semantic Differential, a combination of controlled

association and scaling procedures, provides an instrument which measures the ways meanings vary in terms of the representational mediation processes they identify, while at the same time being largely insensitive to other sources of variation. This instrument was used in the study.

III. PURPOSE OF THE STUDY

The study attempted to determine whether there is a change in the affective meaning of words and concepts from one school subject context to another. Since the context was defined as the situation; i.e., language community within which the word was used, differences in meaning were considered a function of the structure of reality within different disciplines. Language was taken to represent a particular view of reality, not the only view. Differences in meaning attest to the differences in "world view" of users of the language.

Educational research has given little attention to this question and the Semantic Differential had not yet been employed for this specific problem at the time the present study was carried out. This study, therefore, also investigated the suitability of using the Semantic Differential to determine change in meaning due to context.

IV. DEFINITION OF TERMS

Connotative meaning of words. In this study connotative

meaning is distinguished from denotative meaning. Salomon (1966) states that denotation of a word is the sum total of its referents; i.e., the criterial aspects of an object or concept required for membership in a category. For example "chair" denotes every single chair that has existed or will exist in the world of sensory experience. Connotative meaning of words can be subdivided into two parts: the defining qualities of the category or class it names, for example, a particular chair is in terms of certain common characteristics like every other chair; and the emotive or affective responses it arouses in the minds of its users, such as the "goodness" of the concept. In this study which emphasizes the latter aspect, connotative meaning is taken to be that:

... pattern of stimulation which is not the significate and which is a sign of that significate if it evokes in the organism a mediating process, this process (a) being some fractional part of the total behavior elicited by the significate, and (b) producing responses which would not occur without the previous contiguity of non-significate and significate patterns of stimulation. (Osgood, 1957, p. 7).

The responses take into account both the defining qualities and emotive aspects of the word but particularly the latter.

Context. For the purpose of this study context is taken to be comprised of (a) a situational component, (b) a linguistic component. The situational component is considered to be the entire state of affairs at the time of the use of the verbal symbols in that context and all that has led up to it. The linguistic component is the language structure employed in written communication in the subject fields under study. Literature (fiction) selections

in reading and reference material in social studies are the linguistic contexts compared.

Semantic Differential. The Semantic Differential is a measuring instrument which examines the functioning of the representational processes in language behavior through the direction and intensity of the subject's responses to concepts on bipolar scales of descriptive adjectives. These responses serve as an index of these processes.

World View. Each "language community" embodies and perpetuates a particular world view. Speakers of a language or identifiable subset of a language are partners to an agreement to see and think of the world in a certain way -- not the only possible way. The world can be structured in many ways. For the purposes of this study, the language people learn in certain contexts, as well as the total relationships in which it is learned, is taken to direct the formation of a particular structure of the world in each new context.

V. HYPOTHESES AND POSTULATES

Hypotheses

The writer's contention, it will be recalled, is that the context within which concepts are learned and used will affect their connotative meaning and hence influence the structure of reality for the user of the concept.

Specifically, the possibility is envisaged that children's connotative meanings of concepts are learned in

particular contexts -- school subject areas such as literature and social studies. These concepts represent knowledge structured in a particular way in each context. The structuring of knowledge, and its representation in language, organizes a somewhat unique world view, as seen from the perspective of each discipline or field of academic endeavor. It is, therefore, envisaged that a child looks out upon a multitude of realities, each perceived through the lens of language, the meaning producing instrument.

The following general hypothesis is thus suggested: The same concepts will have different positions in semantic space, on the basis of factors identified by the Semantic Differential, when grade five students rate these concepts in: (a) a social studies context; (b) a literature context.

A set of research hypotheses concerning the anticipated differences follows. These hypotheses are accorded theoretical support in the review of literature in a subsequent chapter. First, concepts in different contexts will show a different magnitude or intensity of connotative meaning. Second, concepts will have greater meaningfulness in certain contexts due to greater width of factors. Third, concepts will show a pattern in directionality of response as a function of affective reaction. Fourth, factor structure will fall into two categories. The principal factors of Evaluation, Potency, and Activity should be relatively congruent in the two contexts, having the internal differences indicated above. Secondary factors will be highly

unique to each context showing the specific influence of context upon meaning. Fifth, individual concept factors will show larger differences in meaning than total concept factors and the meaning structures will vary between contexts in the manner indicated above.

Postulates

1. Connotative meaning and change in connotative meaning are accurately reflected in Semantic Differential scores.

2. Connotative meaning of concepts is an expression of the world view of the users of language.

3. It is possible for individual human beings to achieve and maintain a number of differential world views.

4. The grade five child is able to change orientation as a function of change of context.

VI. LIMITATIONS OF THE STUDY

The following limitations are noted:

1. The Semantic Differential coupled with factor analytic procedures is not a completely adequate method of indicating the degree of change due to treatment.

2. There are no tests of statistical significance of factors.

3. Interpretation of factor structures is more subjective than the interpretation of statistical data.

4. The study does not include an examination of other

school subject areas which may serve as meaning producing contexts.

5. Only limited samples of concepts and SD scales are used.

6. The students tested for this study are representative of the total grade five population living in small towns and rural areas in central Alberta, not the total school population.

7. Children in special schools, such as Opportunity Classes for children who are mentally retarded, are not included in the study.

8. Only children taking instruction at the grade five level are included in the study.

VII. ORGANIZATION OF THE STUDY

The study is organized into five chapters. The first chapter, as the introduction to the study, contains the statement of the problem, purposes of the study, definition of terms, and the hypotheses and postulates.

The second chapter consists of the review of the literature and is subdivided into five sections. Sections One to Four review literature and research in fields related to the present study, while Section Five is a report on the pilot study conducted for this investigation.

Chapter Three describes the experimental design, considering the theoretical structure of the study as well as the sample, the treatment, the measuring instrument,

and the means of analysis.

The fourth chapter contains the analysis of the data in terms of the hypotheses proposed in Chapter One. These results are interpreted on the basis of the hypotheses.

Chapter Five, the summary, discussion, and conclusions, reviews and consolidates findings. Appropriate conclusions are suggested as well as the limitations of the study. Finally, implications for further research are considered.

References are cited according to the Publication Manual of the American Psychological Association (1967).

CHAPTER II

REVIEW OF THE LITERATURE

The review of the literature is divided into several sections. Section One deals with theory and research relative to meaning and reality. The second section is an examination of the psychological processes underlying the meaning of concepts as employed in this study and deals with meaning as a representational process. The third section reviews theory and research relative to the effect of context upon word meaning. Section Four describes the instrument in discussing the Semantic Differential. The final section summarizes the findings of an extensive pilot study conducted on the problem being investigated.

I. MEANING AND REALITY

The problem of meaning is as old as language, but until recently it has remained largely in the hands of philosophers and logicians. The seemingly protean variation in meaning has today resulted in semantics assuming a central role in the study of language:

The twentieth century has seen the rise of several movements inspired by a desire to enable the common man to rectify his thinking about the nature of meaning. Not only this. These movements have also been founded on a faith that a knowledge of semantic principles will help an individual gain a more realistic orientation toward all sorts of everyday problems

-- from problems of personal adjustment to problems relating to the nature of the universe. (Carroll, 1963, p. 161).

Church, therefore, suggests that:

... one comes to terms with reality only through a continuing dialectic in which language plays an intimate and indispensable role, and which orients us schematically to a multi-dimensional universe infinitely broader and more variegated than anything that can be known perceptually and at first hand. (Church, 1963, p.136).

Bridger (in Brazier, 1960, p. 426) contends that the rational form of cognition gives man the ability to rearrange and reconstruct the data of his perceptions, so that he grasps reality, not only according to the appearance of things, but also in terms of lawful relationships and interactions between things. He goes on to say that the second signalling system postulated by Russian psychologists can achieve this function because it can use the knowledge of things indirectly experienced or communicated. It is, therefore, not wholly dependent upon personal experience. This tendency to divide human cognition into two systems, the first and second signalling system, the sensory or perceptual and the rational, is evident in the writings of workers from various frames of reference.

Freud (1953) divided human thinking into two basic systems, the conscious and the unconscious -- the unconscious being guided by what he called primary process laws and the conscious by secondary process laws. In primary process thinking, an idea is that of a thing alone -- the direct memory image of the thing, and the associations of things are based on emotional or direct personal experiential

linking of things.

In secondary process thinking, the conscious idea comprises the concrete idea of the thing, plus the verbal idea corresponding to it. This verbal idea arises from consensual validation and the need for communication. Thus the laws of association at this level are largely logical and based on this need for social communication. These laws are analagous to the signalling system formulations. They illustrate the necessity of a symbol system for generating concepts of reality in the mind of man, the influence of language upon concepts, and the need of such a system for social communication.

The result of the application of the semantic perspective to cognition is two realities. On the one hand, we have the concrete world of objects deployed in space, changing in time, and bound together by physical, psychological, and logical relationships. On the other hand, we have the reality of language (Church, 1963, p. 123). Language is real not only because utterances exist and can produce measurable effects on human beings but also in more subtle ways, influencing perception.

These two realities are not independent of each other. We assume that physical reality is going to continue to exist whether or not anyone ever says anything. Linguistic reality is often assumed to refer to concrete reality in the manner of a map or a catalogue. This formulation makes sense only if language is considered a static collection

of verbal labels for reality, the language determinist's perspective. In fact, language symbols are a function of knowledge of reality, and since knowledge is not static but is variable, the meaning of symbols varies as well.

Church (1963, p. 126) sums this situation up by saying that there are no rules for codifying reality. There are only rules for making statements. These rules do not deal with the relationship of words to things, but only with the relationship of words to other words. An utterance therefore describes reality not by standing as a direct or analogical model of reality but by calling the listener's attention to the reality.

Church goes on to say (1963, p. 128) that from the listener's point of view the meaning of an utterance can be defined in terms of the changes it brings about in his relationship to the speaker, to the immediate situation, and to the universe at large. This change may be one of feeling, of action or of knowledge. Meaning is thus amenable to measurement through its behavioral components such as affective change.

As Empson (1951) has pointed out, an utterance tells us several things simultaneously. Not only does it designate a reality, it also says something about the speaker and about his attitude toward what he is talking about, about the situation of speaker and listener, and about his feelings toward the listener. It may also say some things the speaker would rather leave unsaid. Brown (1958)

suggests that the propagandist who wishes to present himself as an unbiased source of information is liable to betray his bias by using the special vocabulary of the faction to which he belongs. In addition, every utterance betrays the orientation of the speaker. The "dimensions" or meaning components of an utterance may be expressed not only in the choice of words but also in the intonation and stress used. Changes within these components constitute different language patterns, representing their referents differentially and consequently organizing a different reality.

Church (1963, p. 129), therefore, argues that words orient us, not to themselves, but to a realm of action, whether actual, potential, or purely symbolic. Language, he adds, arouses us to feeling and action, not through the intermediary of an associated image or collection of images, but directly, by virtue of being meaningful in and of itself.

Meaningfulness exists as schemata belonging to individuals and groups of individuals (Church, 1963, p. 130). People operate within a schematic framework which orders their lives. Considered phenomenologically, a concept within this schema produces a discharge of feelings and corresponding changes in body state when it is mentioned. These changes, Osgood (1957) contends, are meaning states and can be measured by means of a scaling procedure.

A person's schemata consist of the residue of first-hand experiences and all relevant verbalizations that he

has met and made. Reactions to statements are contained in the schematic -- and therefore affective -- arousal they produce (Church, 1963, p. 130). In other words, the non-material and to some degree the concrete or material realms to which language may direct us lie in the schemata of speaker and listener, who as they communicate, they live -- by participation -- each other's thoughts. This doesn't mean that a particular set of response habits comes into play since the individuals may say things never said before or say them in new ways. What happens is that attitudes are thematized generally and subsequently elaborated or expressed alternatively. For example, we find, either in a flash of insight or gradually as time goes by, that an organized body of knowledge has opened up a whole new perspective on reality, that it has effected a basic change in our ways of being mobilized to reality, that it has given us new powers of speech and of perception (Church, 1963, p. 132).

This raises the problem of communication in language. Skinner (1957) solves the problem by denying any such thing. But one must face the fact that people do communicate facts, skills, ideas, attitudes, and values to other people. If we consider, as Church (1963, p. 132) suggests, an item of knowledge as a pragmatic or affective or symbolic mobilization toward reality, then we can certainly induce such mobilization in others. Considering that speaker and listener operate within different contexts of knowledge,

a message may be something very different for receiver and sender. But if the receiver or learner perseveres, he can adapt himself to the particular symbolic reality of the users of a particular kind of language and meaning begins to take shape (Church, 1963, p. 131).

Symbols and symbolic combinations may have a logic of their own. This fact has been generalized by Whorf (1956) in the doctrine of linguistic relativity which says that the structure of perception and thought is dictated by the structure of the language one speaks. Thus what are usually described as cultural differences in behavior would become linguistic differences and the language would be the incarnation of the culture. According to this thesis, therefore, languages are molds into which minds are poured (Brown and Lenneberg in Saporta, 1961). On this basis Whorf (1956, p. 235) reasons that: "Facts are unlike to speakers whose language background provides for unlike formulation of them." Whorf thus holds that (a) the world is differently experienced and conceived in different linguistic communities (b) language is causally related to these psychological differences.

Whorf did not extend his thesis to a comparison of cognitive modes among the European peoples. He put all their languages under the term Standard Average European and assumed them to have one "mind" and one culture. "Certainly there are no differences within Standard Average European to equal the contrast of Hopi and English.

Probably, however, there are smaller differences in cognition which go with smaller differences in language" (Brown, 1958, p. 259). For example, the German's "Schadenfreude" has no single equivalent word in English and the English "home" has no single word equivalent in French. These differences of lexicon may have cognitive significance (Brown, 1958, p. 259). Brown adds that if we extend our notion of semantics to include all the contexts in which a word may be used -- all the things said of it, all the adjectives applied to it, all the emotional situations in which it occurs -- one can readily see that words which have identical referents are not themselves identical. A full description of any of these words would involve a description of the greater part of the culture to which the word belongs. Ruth Benedict (1946) has presented the Japanese culture by attempting to give the full meanings of a few Japanese words.

Empirical tests of the Whorf hypothesis, designed to determine whether the thought processes of certain primitive peoples actually reflect the structure of their languages, yield equivocal results (Brown, 1958, ch. 7). This is due largely to the kinds of measures employed -- sorting tests. These are remote from the subject's everyday activities, therefore generalization is not appropriate. Osgood and his associates (1960) have attempted to test the Whorf hypothesis by obtaining Semantic Differential scalings of equivalent terms in different languages. Contrary to the concept of

language relativity, there is good agreement between cultures about the meanings of equivalent words. But it seems likely that responses on the Semantic Differential are to the head meanings of words and quite different meanings would emerge if one were to present the words in different contexts (Church, 1963, p. 186).

When this problem was approached from another perspective significant positive results were obtained. Brown and Lenneberg (in Saporta, 1961, pp. 493-50) using a color coding procedure, found evidence to support the contention that language is a mold of thought since speech is a patterned response that is learned only when the governing cognitive patterns have been grasped. This finding has an important bearing upon language relativity as seen from the perspective of a single language which is the basis of the present study.

Other authors have believed a relationship to exist between language and thought similar to that proposed by Whorf. Cassirer, a philosopher, maintained that language is a direct manifestation of knowledge which is in agreement with other German writers such as Wandt and Buhler (Saporta, 1961, p. 492). Piaget (in Baldwin, 1967) believes that language is an internalized representation of actions upon reality and that these actions are basic constituents of different schemata which assimilate reality. Therefore, he too would agree that language is a manifestation of knowledge (defined as action). Orwell in his novel 1984

describes a totalitarian England of the future. The efficient dictatorship of that day invents a language -- Newspeak -- in which it is impossible to express or even think a rebellious thought.

This view of language, meaning, and reality has created a theoretical orientation and an area of study called linguistic Weltanschauung (world view) (Carroll, 1963, p. 43). The linguistic Weltanschauung problem concerns the way in which a language system organizes human experience. Carroll (1963, p. 46) goes on to say that an appropriate hypothesis relative to the Weltanschauung thesis would be that linguistic structure predisposes the individual to pay attention to some things more than others, or to perceive things in one mode rather than in others, even though with respect to his general perceptual capacities he is no different, on the average, from users of other languages. Therefore, one world view is as good as another, and for that matter "... different world views and logics can be expressed in the same language" (Carroll, 1963, p. 47).

Language relativity and the concept of linguistic Weltanschauung applies particularly well in a complex society such as that extant in North America. Here, and in modern states generally, there are many minds, many languages, and many cultures (Brown, 1958, p. 255).

Bernstein (1961) investigated the relationship between an urban pupil's cultural and language background and the educational measures appropriate to successful learning.

He suggested that the forms of spoken language induce in their learning orientations to particular orders of learning, and condition different dimensions of relevance. Speech, he concluded, becomes a major means of selectively reinforcing perceptions and forms of spoken language mark out what is relevant affectively, cognitively, and socially, and "... experience is transformed by what is made relevant" (Bernstein, 1961, p. 168).

Labov (1966), in findings similar to Bernstein's, showed that social class was a determiner of the language form and structure used and that this form and structure reflected differences in the cognitive processing of environmental phenomena. Different meanings were attributed to the same concepts depending on the social class within which these concepts were being used. Also, Labov discovered that the individual growing up and learning a particular form of language necessarily was predisposed to the same sorts of perceptions as those from whom he learned the language, his parents and peers.

Most of the cognitive and linguistic differences, in terms of category availability and codability, as discovered by Whorf and others, can be found also in all segments of our complex society. As illustrated by Brown (1958, p. 255), cattle breeders recognize and name many kinds of cattle, experts on kinship terminology know all the kinds of aunts there are, and ornithologists are not satisfied to speak of parrots. There are subcommunities for whom particular

regions of experience are more differentiated than they are for others and, within these subcommunities, there is a special lexicon or a special meaning component for words to meet special cognitive needs. To the degree that a group is socially, intellectually, and technologically homogeneous, with the same concerns shared by all, the same vocabulary should be shared by all. In a society as differentiated as ours each man plays multiple roles, and develops agility in moving from one to another. For example, Shannon and Weaver (1949), writing on the mathematical theory of communication, are not only information theorists, they are also mathematicians and scholars. Working in a new area they must see it from both the inside and outside and perform the linguistic and cognitive operations appropriate to both positions.

The present study proposes to investigate the influence of these subcommunities or "intralanguage communities" upon the meaning of concepts since linguistic relativity must take account of social and technological complexity. The contention is held that various structured language patterns such as those employed in academic disciplines develop differentiated meanings for concepts resulting from the specialized knowledge and the particular kinds of relationships of environmental phenomena as seen within these contexts. The child in school thus must develop the ability to move freely from one context to another in order to achieve meaning from the language used.

While the notion that language influences our awareness of reality is basic to this study, it is doubtful whether the connection is as direct as Whorf saw it. Most fundamentally, the Whorfian view concerns itself with words rather than with larger linguistic structures and the internalized states they represent. Culture considered at any level cannot be reduced simply to the vocabulary of its language. The values and interpretations of meaning of a culture or any organized segment of it, when they are made explicit, are embodied in percepts and didactic statements, not in single words (Church, 1963, p. 134). Kluckhohn (1949, pp. 33-37) has pointed out that an organized approach to reality contains, in addition to explicit beliefs and values, many implicit unverbilized elements which nevertheless affect perception and behavior. Such implicit elements may be carried in the affective connotation of terms.

This study, therefore, is set in these terms. It is hypothesized that the total language structures of the disciplines and fields of study structure reality in a way peculiar to each of them. Further, it is hypothesized that a significant component of meaning lies within the affective dimension of words as encompassed by their connotative meanings. Finally, it is hypothesized that situational context, in terms of school subject areas, differentiates among these language patterns and influences the child's perceptions of reality.

II. MEANING AS A REPRESENTATIONAL MEDIATION PROCESS AND THE CONNOTATIVE MEANING OF WORDS

On the basis of the classification scheme used by Charles Morris (1946), the relation of symbols to situations and behaviors is considered pragmatic meaning, the relation of symbols to other symbols is syntactical meaning, and the relation of symbols to their significates is considered semantical meaning. This latter area is the particular concern of the philosopher, psychologist, and educator. Both the psychologist and the educator are typically interested, the one in defining and the other in developing and controlling, that distinctive mediational process or state which occurs in the organism whenever a sign is received (decoded) or produced (encoded).

The study of the problem of the mediational process can be started with the following self-evident fact: "The pattern of stimulation which is a sign is never identical with the pattern of stimulation which is the significate" (Osgood, 1957, p. 3). In other words, the word is not the same stimulus as the object it signifies. Nevertheless, the sign (word) does come to elicit behaviors which are in some manner relevant to the significate, a capacity not shared by an infinite number of other stimulus patterns that are not symbolic of the object. The problem for anyone interested in meaning then becomes: "Under what conditions does a stimulus which is not the significate

become a sign of that significate" (Osgood, 1957, p. 4).

Osgood (1957, p. 5) contends that certain stimulus patterns have a "wired-in" connection with certain behavior patterns (unconditioned reflexes) and additional stimuli have acquired this capacity (conditional reflexes). For example, in animals, a shock to the foot-pads regularly and reliably elicits a complex pattern of escape reactions (leaping, running, urinating, autonomic "fear" reactions, and the like). The significate, then, is any stimulus which, in a given situation regularly produces a predictable pattern of behavior. But there are a multitude of stimuli which do not have this capacity -- a buzzer does not reliably produce escape behavior like the shock does. The problem is to show how meaningless stimuli become meaningful symbols.

Single stage conditioning does not provide a satisfactory answer since reactions to symbols are seldom identical to those made to the objects signified. On the other hand, a two stage conditioning process can serve to explain the procedure of creating meaning in symbols. This process can be summarized as follows: whenever some stimulus other than the significate is contiguous with the significate, it will acquire an increment of association with some portion of the total behavior elicited by the significate as a representational mediation process (Osgood, 1957, p. 6).

The stimulus-producing process, Figure I (A), (r_m — s_m) generated during the decoding of the sign or symbol, is representational because it is part of the same behavior (R_T)

produced by the significate \dot{S} and is thus its symbolic, semantic property. It is mediational because the self-stimulation (s_m) (the encoding of the responses) produced by making this short-circuited reaction can now become associated with any instrumental acts (R_x) which "take account of" the thing signified. The "taking account of" the significate results in suitable or adaptive responses (R_x) being evoked.

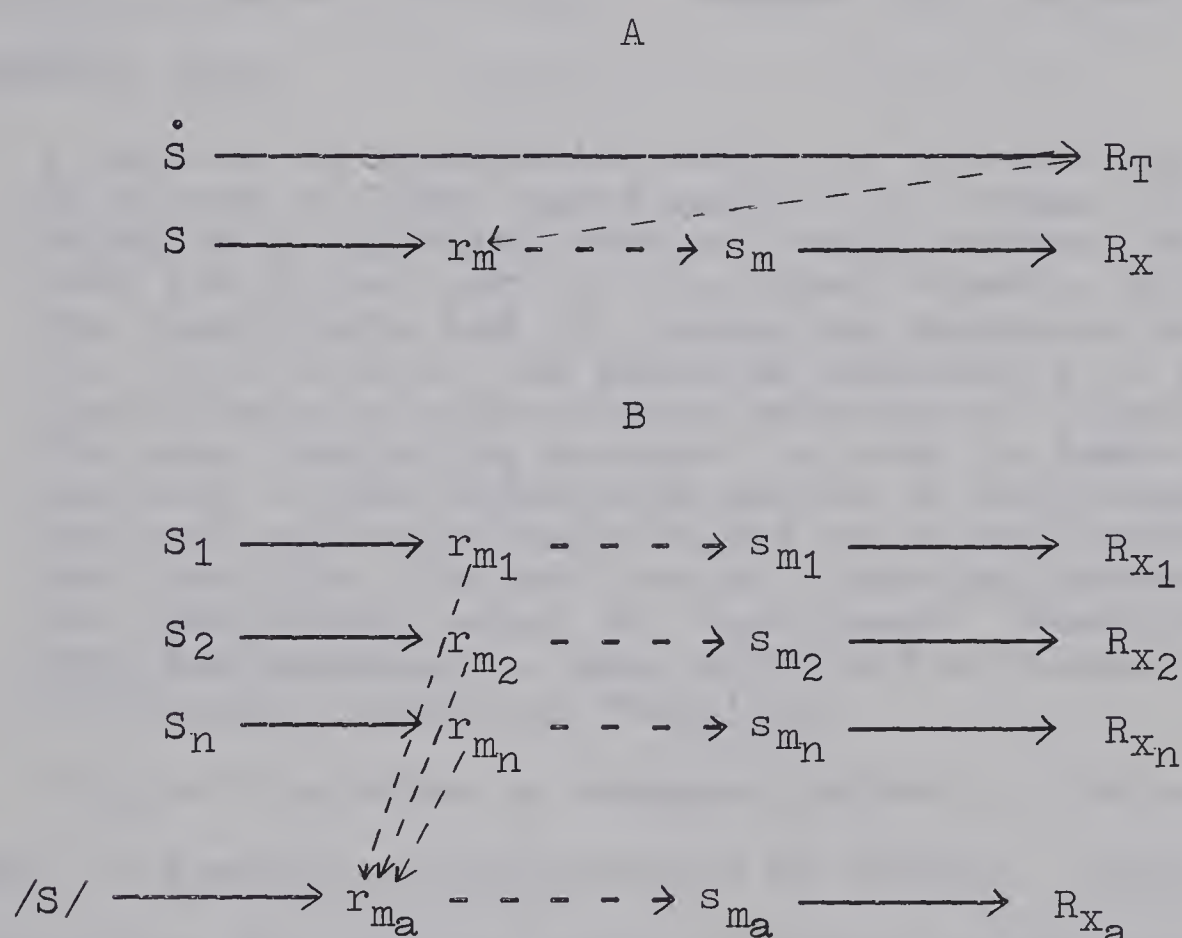


FIGURE 1

AN ILLUSTRATION OF THE DEVELOPMENT OF SIGN PROCESSES
 A. DEVELOPMENT OF A SIGN B. DEVELOPMENT OF AN ASSIGN
 (Osgood, 1957, p. 7)

Most signs used in communications are assigns "... their meanings are literally assigned to them via association with other signs rather than via direct association with objects signified" (Osgood, 1957, p. 8). As seen in

Figure 1 (B), the stimulus pattern /S/ acquires portions of the mediating reactions already associated with the primary signs. Thus the meanings which different individuals have for the same signs will vary to the extent that their behavior towards the things signified have varied.

According to this view, then, words represent things because these produce in human organisms some replica of the actual behavior toward these things, as a mediation process. Osgood (1957, p. 7) states this proposition formally thus:

A pattern of stimulation which is not the significate is a sign of that significate if it evokes in the organism a mediating process, this process (a) being some fractional part of the total behavior elicited by the significate and (b) producing responses which would not occur without the previous contiguity of non-significate and significate patterns of stimulation. The term "mediating process" is used to leave open the question of the underlying nature of such representational mediators which might be neural events rather than muscular contractions or glandular secretions in the traditional sense of "reactions." Nevertheless they are presumed to have all the functional properties of stimulus producing reactions.

Figure 2 provides a summary picture of the psychological model of meaning as hypothesized by Osgood. It has been stated that the sign or symbol process is stimulus producing in that the effect of sensory signals resulting from stimulus bombardment will be to elicit representational mediators (r_m 's) to produce meaning (s_m 's). The meaning that is assigned in the $r_m \dots s_m$ process involves both encoding and decoding sequences. In the decoding sequence, environmental input signs or symbols, S, from the message level generate sensory signals at the cortical projection level.

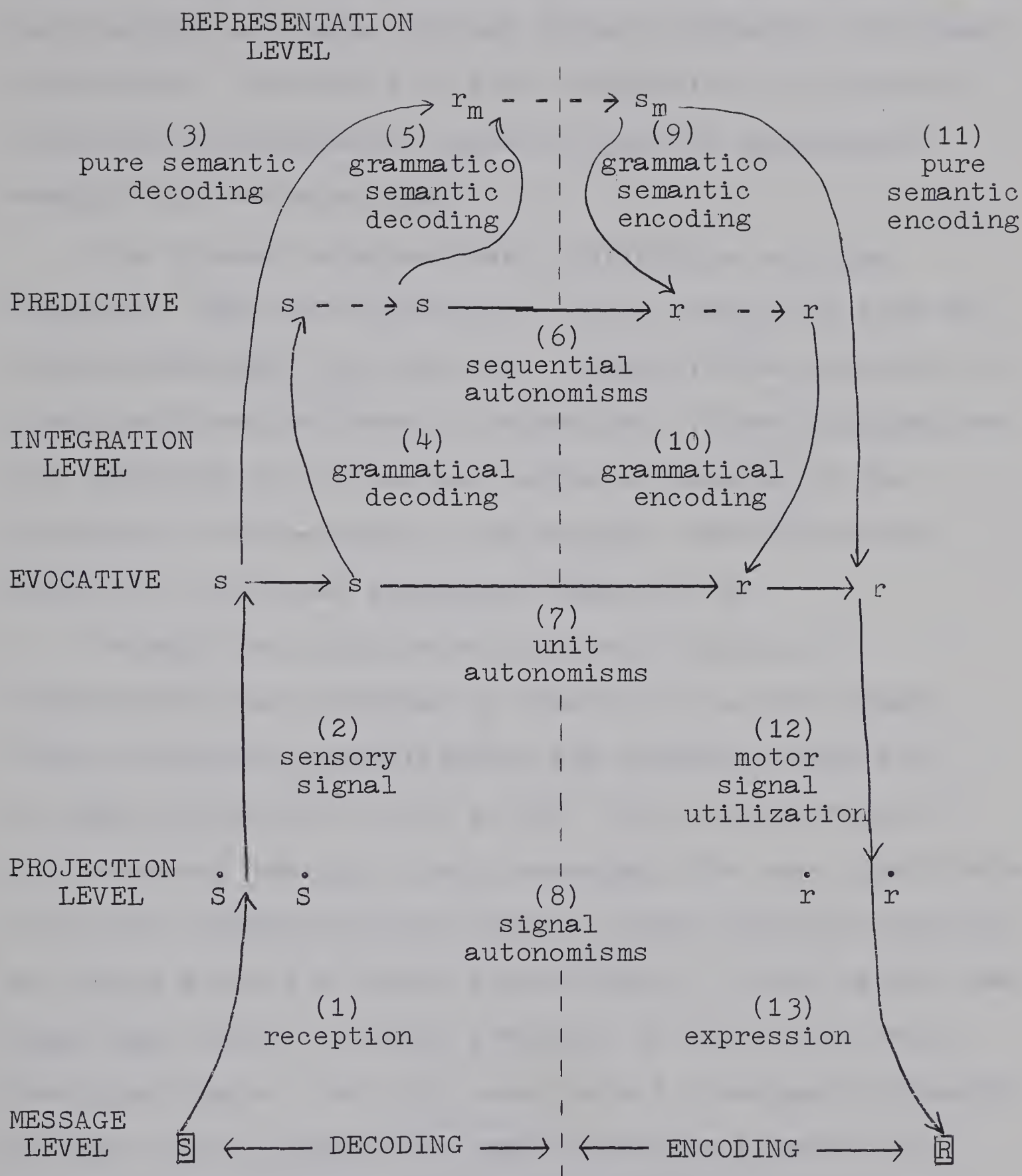


FIGURE 2

GENERALIZED MEANING DEVELOPMENT MODEL

Osgood (in Colorado University, 1957, p. 106)

Meaning occurs at the integration level for the first time as associations are made, through neural correlates, with past experience. The effect of such integration is to elicit representation-mediators (r_m 's) to provide appropriate meaning for the input data.

The process reverses itself during the encoding sequence. The self-stimulation (s_m 's), resulting from the representational (r_m) activity, combine in the selection of previously learned verbal integrations. These integrations are reflected in the central neural correlates of the projection level signals. The signals, when activated, result in the verbal expression behavior, R.

Perhaps the single most important function of representational processes in behavior is as the common term in mediated generalization and transfer (Osgood in Colorado University, 1957, p. 96). As shown in Figure 3 (A), whenever various stimuli accompany the same significate, they must become associated with a common mediation process, and hence acquire a common significance. To the extent that signs have varied in their frequency of association with the significate, they will constitute a convergent hierarchy of signs which produce the same observable behavior or meaning but with varying strength. Also, when different behaviors are reinforced in association with a particular sign, they produce a "divergent hierarchy of instrumental acts", associated with the same mediator as shown in Figure 3 (B). These alternatives also vary in habit strength or

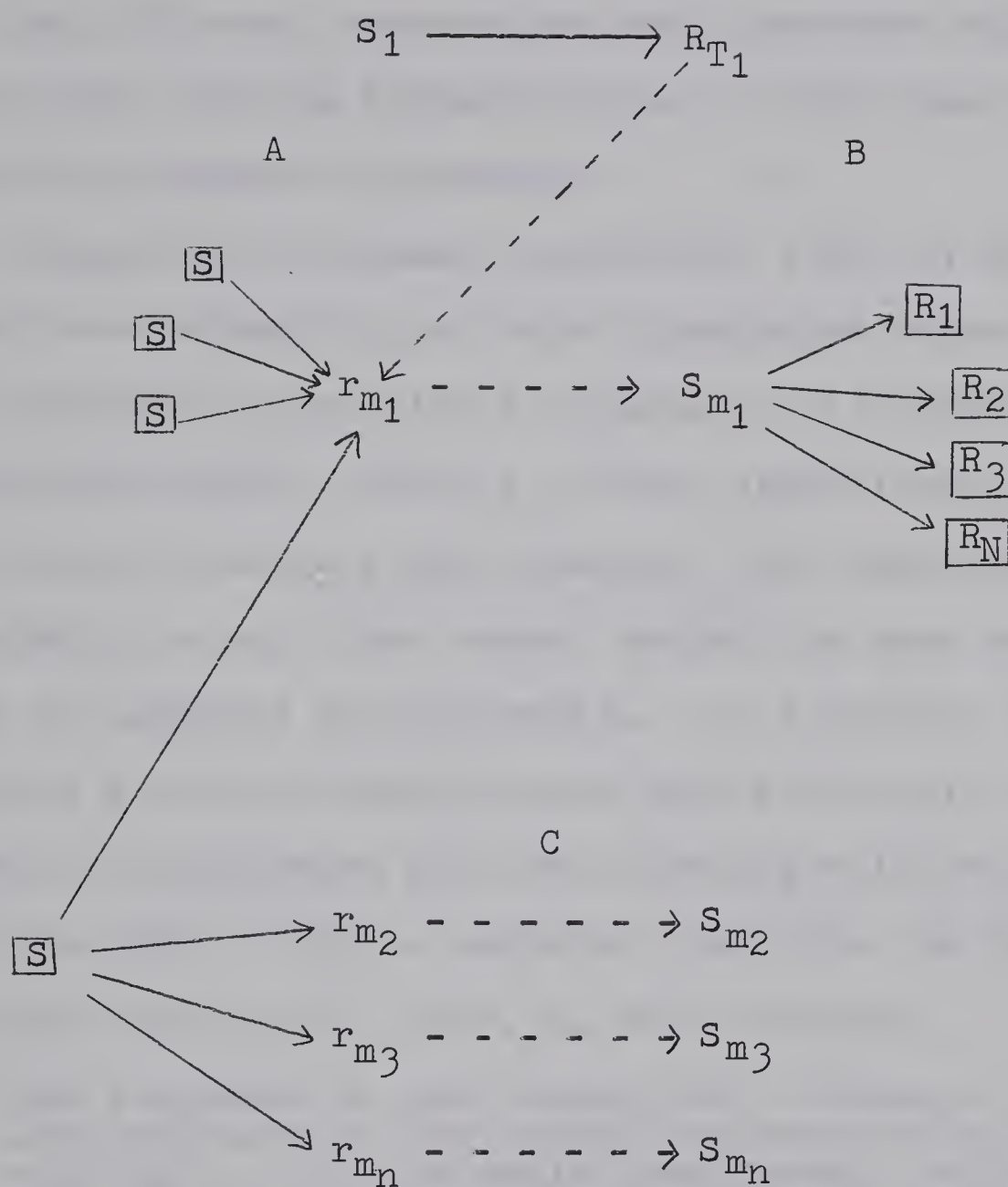


FIGURE 3

HIERARCHIES

- A. CONVERGENT HIERARCHY OF SIGNS
- B. DIVERGENT HIERARCHY OF BEHAVIORS
- C. DIVERGENT HIERARCHY OF MEDIATORS

(After Osgood, in Colorado University, 1957, p. 97)

probability and selection among them will depend upon contextual cues. Finally, as shown in Figure 3 (C), signs may become associated with divergent hierarchies of mediators in that different representational processes will tend to occur with varying probabilities. In this case also, selection depends on context.

Osgood (in Colorado University, 1957, p. 98) believes that the availability of such hierarchies makes possible the observed flexibility in behavior. If, related to a particular symbol having a certain significance or meaning, the subject learns a new behavior, this immediately becomes available to any other symbol having the same meaning. This is mediated generalization. If a new set of symbols acquire a certain significance, all previously learned behaviors associated with this meaning will become available to this sign. This is mediated transfer. As Osgood (in Colorado University, 1957, p. 98) concludes:

The processes we call cognitive -- concept formation and utilization, attitudes, personality traits, problem solving -- fit this mediational model, in the sense that they involve a class of stimulus situations associated with a common significance which mediates a class of alternative behaviors.

It is upon this point that the present investigator rests his case. It is hypothesized that the same concepts are capable of evoking differential affective responses as a function of the situational context, this situational context being knowledge as represented by language in the different disciplines. By virtue of these systematic differences, the mediating process generates a particular

set of responses in certain contexts.

It is important to bear in mind the indirectness of the relations between words and things when considering the meanings of words. Ogden and Richards (1956, p. 11) illustrate this by a diagram in which the three factors involved whenever any statement is made or understood are placed at the corners of a triangle, the relations which hold between them being represented by the sides. It is thus seen that the base of the triangle is quite different from the sides.

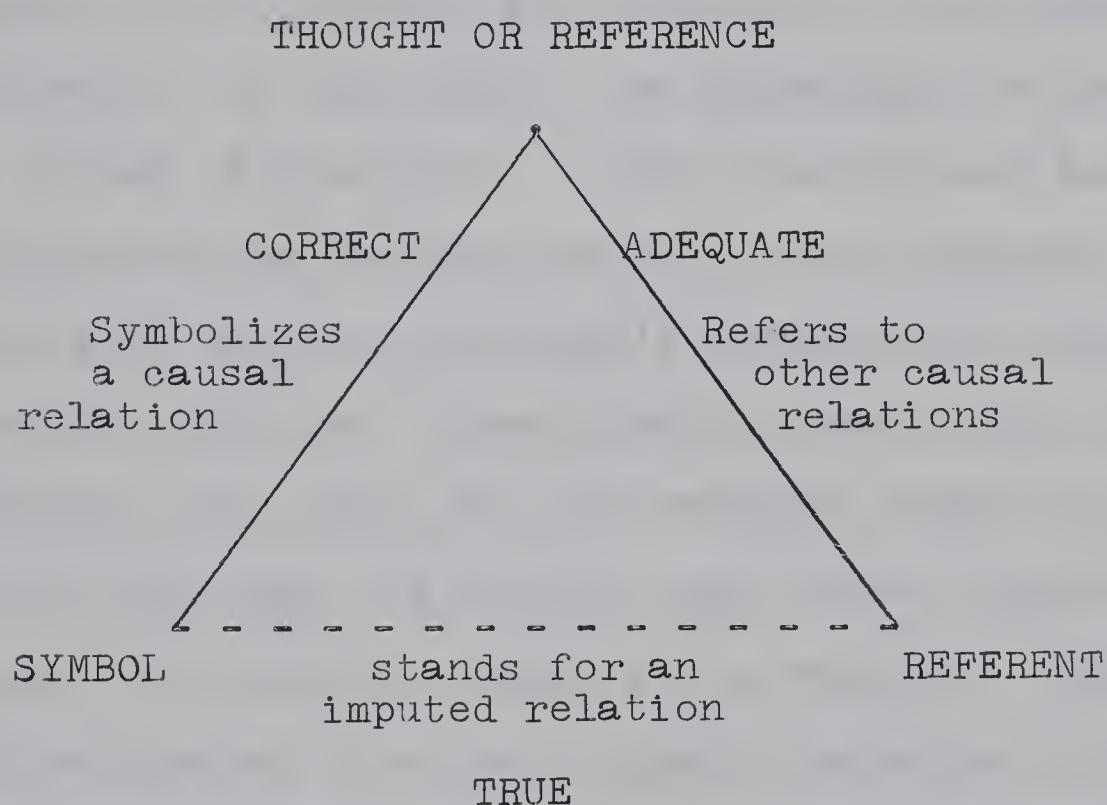


FIGURE 4

THE RELATIONS BETWEEN WORDS AND THINGS

(Ogden & Richards, 1956, p. 11)

Between a thought and a symbol certain causal relations exist since the symbolism is caused partly by the reference and partly by social and psychological factors. The latter

include the purpose for which we are making the reference, the proposed effect of our symbols on other persons and on our own attitude (Ogden & Richards, 1956, pp. 10-11). This perspective upon meaning provides additional theoretical justification for the position taken in this study; i.e., the meaning of symbols is a function of their use and consequently different realities are structured by language in different situations (contexts).

Between thought and referent a more or less direct relation exists. The relation is direct if one refers to a concrete bit of reality and indirect if the reality is not concrete. At this point, the knowledge one possesses of the things of the world -- both concrete and abstract -- will influence the meaning one has of the referent. Also affected will be the individual's affective or connotative associations with the concepts which change with context.

Between the symbol and the referent there is no relevant relation other than the indirect one, which consists in its being used by someone to stand for a referent. There is an imputed as opposed to a real relation existing indirectly around the two sides of the triangle (Ogden & Richards, 1956, pp. 11-12). This indirectness of connection has led Salomon to say: "Words don't mean; people mean." (1966, p. 2).

Meaning exists in the thought or reference corner of the triangle and as Miller puts it:

How a sentence is actually manufactured or understood by the users of the language -- what particular cognitive processes he performs -- is not a linguistic problem, but a psychological one. (Miller, 1962, p. 748).

Osgood in the developmental work on the Semantic Differential, addressed himself to this problem. He concluded that in the measurement of meaning it is:

... necessary to focus on that "state of" or "event in" a sign-using organism that is at once a necessary subsequent condition (r_m) in the decoding of signs and a necessary antecedent condition (s_m) in the encoding of signs. (Osgood, 1957, pp. 320-321).

He further suggests that when a language user comes out with sequences of linguistic responses which are ordered both as to structural and semantic characteristics, we assume that there is some ordered, selective system operating within the organism. Thus the student of meaning must determine the correlation between message events and states of the organism.

Osgood contends that the Semantic Differential is capable of indexing these internal states leading to meaningful responses. The justification for the use of the term meaning for the kinds of correlations between signs and organismic states measured by the Semantic Differential is produced by the distinction between what has variously been called denotative, designative, or referential "meaning" and what has been called connotative, emotive, or metaphorical "meaning".

What we shall call the denotation of a word is the sum total of its referents: for example, chair denotes every single chair that has existed or ever will exist, in the world of sensory experience. The connotation of a word is divided into two parts: the defining qualities of the category or class it names, (the linguistic connotation) and the emotive or affective responses it arouses in the minds of its users. (Salomon, 1966, p. 14).

Salomon then goes on to say that through experience we learn that no two objects or events are identical, thus when one categorizes objects as members of a class he does this on the basis of defining qualities. For example, we see many individual trees, no two exactly alike, but if it is necessary they can all be categorized by the label tree. The word tree denotes every individual unduplicable object in the category; it connotes the common characteristics which identify it as belonging to the class of trees. We take out of all the observed individual trees only certain common characteristics and use the relatively abstract word tree to connote these qualities.

Affective responses to words are motivated by such impulses as those we call attraction, dislike, powerlessness, security, and others. Whenever the users of a language show a fairly uniform emotional response to the word, that response becomes part of the connotation, and therefore part of the standard meaning of the word in that language (Salomon, 1966, p. 17). This factor makes a measure of affective meaning like the Semantic Differential a measure of the connotation of a word and in part a measure of its total meaning.

The emotive component of meaning reflects much of the current technological-sociological-moral climate making it subject to more rapid and unpredictable change than are the denotation and linguistic connotation. At any one time the emotive connotation of a given term may vary a great deal

in both kind and intensity from one situation or context to another for the same group of individuals. And:

Since we have defined symbolic meaning as the totality of what is conveyed by a symbol ... no two words are exactly synonymous, regardless of what they denote or what defining qualities they connote, as long as any tinge of emotive association, however miniscule, differentiates them. (Salomon, 1966, p. 30).

Ogden and Richards (1956, p. 188) sum up one view of the relation of connotation to denotation as follows:

The connotation of a word determines its denotation which in turn determines its comprehension, i.e. the properties common to the things to which it can be applied. The term connotation is, however, often used with the same sense as comprehension.

Although this account is rather artificial, since there can be no dichotomy in word meaning, it is essential for the purposes of this study to subject the meaning of a word to such analysis. As Ogden and Richards (1956, pp. 188-189) conclude:

The sole entities in the real world are propertied things only symbolically distinguishable into properties and things. [And] no convenient symbolic device is objectionable as long as we know it is a device and do not suppose it to be an addition to our knowledge.

Osgood (1959, p. 195) takes an even more positive position in stating that there are two independently variable conditions determining agreement in "meaning" and that it is essential that we discriminate with two terms such as denotative and connotative. He defines denotative meaning as follows: a conventional correlation between, (1) with reference to a speaker, a nonlinguistic stimulus pattern, and a linguistic reaction, or (2) with reference to the hearer, a linguistic stimulus pattern,

and a nonlinguistic stimulus pattern, (or a response appropriate to this nonlinguistic stimulus pattern). The connotative meaning of a linguistic sign is defined as the habitual symbolic response which occurs in a sign-user when: (1) a linguistic sign is produced (with reference to speaker); or (2) a linguistic sign is received (with reference to hearer). It is such symbolic representational processes that are presumably indexed by the Semantic Differential (Osgood, 1959, pp. 193-194).

Osgood (1959, p. 194) suggests that connotative agreement is not necessary for denotative agreement to occur so that a shared psychological state between the two communicators is not the sine qua non of denotative agreement between them. On the other hand:

agreement on the referents of signs implies nothing whatsoever about similarity of the representational states associated with these signs, but rather that these states have entered into the same sets of verbal relations between situations and verbal responses. (Osgood, 1957, p. 323).

At the same time, language users do develop representation processes in association with signs and these processes are intimately concerned with their behavior. Thus one must conclude that:

... the representational states indexed by the Semantic Differential are not the only determinants operating in language production; linguistic and situational variables also contribute to selective encoding. (Osgood, 1957, p. 325).

It is to the influence of these situational variables that this study addresses itself.

III. CONTEXT

Miller and Selfridge (in Saporta, 1961, p. 199) state that psychologists use the word context to refer to the totality of conditions influencing a behavioral event. When a man talks his choice of words depends upon his training, his needs and intentions, the situation, and audience. These factors comprise the total context in which words must be studied. The changes in meaning generated by variations in context as described above are held to be representative of differentiated structures of reality for users of the language. This view of context and its effects forms the basis for the hypotheses of the present study.

Howes and Osgood (in Saporta, 1961, p. 214) contend that it is a commonplace that meanings of words depend upon the contexts in which they occur. This dependence sets a fundamental problem in the psychology of language: calculation of the psychological effects of a word in its context from the individual properties of the word and of the contextual elements. The linguistic context of a person's speech may thus be divided into (a) the homogeneous linguistic context -- the context provided by his own previous language behavior; and (b) the heterogeneous linguistic context -- that provided by utterances of other persons in his environment. The present study will be concerned largely with heterogeneous linguistic contexts -- i.e. studying the effect on experimental subjects of the language

communities comprising academic disciplines and areas of study.

According to Bloomfield (in Saporta, 1961, p. 239), meaning of a linguistic form is defined as the situation in which the speaker utters it and the response it calls forth in the hearer. He goes on to say (p. 240) that the situations which prompt us to utter any one linguistic form are quite varied; philosophers tell us in fact that no two situations are ever alike. A very important part of every situation is the state of the speaker's body. This includes, of course, the predisposition of his nervous system which results from all his experiences, linguistic and other, up to this moment. The mental processes or internal body processes which represent the linguistic meaning of words are known to each of us only through speech utterances and other observable actions and are consequently available as a means of measuring that meaning.

According to this view we can define meanings of words only through the stable characteristics of language. This presupposition of linguistics is, according to Bloomfield, the fundamental assumption of linguistic study namely: "In certain communities (speech-communities) some speech utterances are alike as to form and meaning" (Bloomfield in Saporta, 1961, p. 240). The logical corollary to this presupposition can therefore be stated as: In different speech communities the same utterances will be unlike as to meaning.

Bloomfield adds that the remarkable thing about these variant meanings is our assurance and our agreement in viewing (in one context) one of these meanings as normal (or central) and others as marginal (metaphoric or transferred). The central meaning is favored in the sense that we understand a form (that is, respond to it) in the central meaning unless some feature of the practical situation forces us to look to a transferred meaning. This results in a change in meaning of the symbol, occurring due to change in context.

The second important way in which meanings show instability is in the presence of supplementary values which we call connotations. The meaning of a form for any individual is the result of the situations in which he has heard this form. If he has heard it within a certain context his use of it will deviate from that which would result from another context. The most important connotations arise from the social and educational backgrounds of speakers who use the form.

The varieties of connotation are countless and as a whole cannot be clearly distinguished from denotative meaning. In the last analysis, every speech form has its own connotative flavor for the entire speech community and this is further modified for each individual by the connotation which that form has acquired for him through his special experience (Bloomfield in Saporta, 1961, p. 249).

Wells (in Saporta, 1961, p. 271) states that a

currently popular account of meaning recognizes three factors: sign, object, and user. It can be seen, he adds, that we must also mention the time of signification, for example A is a sign to B of C at time D; at another time, it may be a sign to B of something different, or may not be a sign to B at all. This view illustrates the influence of situations (context) upon meaning and supports the well known contention that the one and the same sign may have more than one sense. Thus nominalistic philosophers hold that every fresh instance of a sign involves a new meaning of it.

Chomsky (in De Cecco, 1967, p. 329) asserts that the concepts of stimulus and response as they impinge upon the development of meaning are not meant to be taken literally. He goes on to say that a response is often said to be "controlled" by a situation or state of affairs (context) and that the "controlling stimulus" need not even impinge on the responding mechanism.

Lenneberg and Roberts (in Saporta, 1961, p. 500) state that a verbal response is not given to just one stimulus but to a group of similar though not identical stimuli. The question, they add, of whether there is a transfer from the observed speech behavior to nonlinguistic types of behavior must be ascertained empirically. No single answer is likely since speech may affect memory, but not perception; or it may involve problem-solving ability but not other kinds of learning. Therefore it is essential that systematic

empirical research be undertaken to study the relationships between language and the cognitive functions which process reality. The present study will attempt to investigate this problem as it exists in the elementary school setting. According to the wider or narrower context within which a word is used there will be a greater or lesser variety of associations as well as a different class of correlates. Thus verbal and situational contexts have considerable influence upon the usage of words. The degree of flexibility of use of a word is thus a significant phenomenon in comparing meanings.

Church (1963, p. 110) states that consciousness can be concentrated on the object or it can be layered into a simultaneous awareness of object and self. The background elements in a situation are, by definition, not explicitly perceived, but they play a part in shaping our experience of the situation. For instance in an experiment by Daniels (in Church, 1963, p. 110) the words club and spade were embedded in a ten-word vocabulary list. These words were never defined as card suits by subjects who had no interest in cards, but were so defined half the time by subjects who were enthusiastic card players and every time by card players interrupted during a card game to serve as subjects. Thus schemata which play so large a part in organizing and integrating experience are not ordinarily conscious. In general we are aware of ourselves only in terms of the total feeling states that accompany behavior; we know in

a general way what we are doing, but hardly at all, except in problematical situations, how we are going about doing it. Least of all do we question our own motives. We do something because we feel like doing it, and not to attain such-and-such logical ends (Pap in Hook, 1959). The question is not so much whether a motive is conscious or unconscious but in what way it is conscious.

Krathwohl (1964, p. 53) contends that there are at all levels of feeling or affect conscious or cognitive components and similarly one can find affective components for cognitive functions.

Arnold (1960, p. 53) states that while Titchener was convinced that feeling was an element of consciousness, later psychologists inclined more and more to the view that feeling is not directly experienced but is a "meaning" that is gradually built up. Carr (1925), for instance thought that pleasantness and unpleasantness are names given to two distinct meanings; pleasantness means the habitual approach response to the stimulus, unpleasantness the habitual withdrawal response. In this way, he equated feeling with wanting or not wanting as tendencies to approach and withdrawal. It is the meaning aspect of this view that is of interest in the present study. If these meanings generate different responses, we have the necessary correlation between measured differences in meaning and the changes in behavior hypothesized to occur in different contexts.

Hunt (1939) agreed with Carr that feeling "means" habitual reaction tendencies and is the result of the readiness for action that is experienced as emotion. If feeling is a meaning, then according to Beebe-Center, we must say they are constructs. He says:

We have seen that the terms pleasantness and unpleasantness, as used by observers, represent meanings. Such meanings are the concepts built up by the layman to interpret his world. The psychologist, seeking to interpret his facts, does essentially the same but does so wittingly and, in so far as possible, according to strict logical procedures. Such concepts he calls structures. (Beebe-Center, 1951, p. 260).

Upon such a contention the experimenter builds his case for change in connotative meaning due to context and the structure of the language within the context. The structure of reality for individuals thus becomes a function of the meanings of words, these meanings being undergirded by affective responses.

Feeling and emotion cannot be looked upon only as abstract constructs for they are also the "... lively going out of a living being to an object [so that] feelings and emotions are real, as real as the dog that chases us or the sip of wine we savor" (Arnold, 1960, p. 58).

For Leeper, all emotions normally have an organization which directs and sustains action. Hence "emotional processes operate primarily as motives. It means that they are processes which arouse, sustain and direct activity" (Leeper, 1948, p. 17). As motives, emotions are aroused in a psychological situation and are part of the meaning of the concepts in that situation:

It is quite a possible hypothesis that the perception of the emotion producing situation produces the emotional process (which may have a conscious aspect to it, and which may produce also an autonomic discharge, either directly or via some subcortical centers, and which may then be reinforced or supported by widespread bodily changes). And it is quite a possible hypothesis that this emotional process ... then operates to motivate behavior. (Leeper, 1948, p. 18).

A motive, then, seems to be an action impulse (a want that is appraised as good for action) (Arnold, 1960, p. 233).

In discussing the neural substrate of emotion and motivation, Gellhorn and Loofbourrow (1963, p. 39) contend that the matrix of emotion is the central nervous system and that the hypothalamus occupies a position of pre-eminence in the mechanisms of emotional integration. This structure, with its connections and interactions with other parts of the nervous system, is essential to the internal states which underlie emotion.

Murphy and Gellhorn (in Gellhorn & Loofbourrow, 1963, p. 40) point out that since the hypothalamus can activate neocortical association areas, it has special significance in emotion. Alterations of the excitability and degree of activity in association areas must alter the character of sensations resulting from the arrival at the cortex of impulses via specific sensory projections including language stimuli. Thus it appears inevitable that the meaning of specific stimuli must be derived from interactions among neural systems which include the association areas. Emotional feeling and the affective or connotative meanings of words must depend on meanings so derived.

In addition to its direct influence of the neocortex, the hypothalamus may be considered the "hub" of the limbic system which also has important functional connections with the neocortex. Thus the neocortex, which is essential to the interpretation of internal states; i.e., the affect or feeling in emotion, is presumably able to make such interpretation by virtue of its interaction with other structures, especially hypothalamic, limbic and reticular, as well as interaction among various areas of the neocortex itself (Gellhorn & Loofbourrow, 1963, p. 40).

One of the foremost theories developed to explain emotion (affect) and motivation was the Cannon-Bard Theory. This theory corresponds closely with Osgood's view of the representational mediation process. According to this theory (Cannon, 1927; 1931) a "thalamic process" was essential to the experience of emotion. As originally postulated by Cannon, a simple relay of impulses to the cortex via the thalamus resulted in awareness of the stimuli but no emotion. This is synonymous with the projection and integration levels in Osgood's model (Figure 4). Cannon-Bard go on to say that if the arrival of impulses at the cortex resulted in thalamic release from cortical inhibition, the released "thalamic process" added to the perception the peculiar quality of emotion. This stage is represented by the representational level in Osgood's model. Here "... the neutral stimulus will acquire an increment of association with some distinctive portion of the total behavior elicited

by the significate" (Osgood in Jones, 1957, p. 355).

Bard (1934) insisted that the thalamic process was, of itself, inadequate. It must send signals back to the cortex to confer the emotional quality on perception. Osgood (in Jones, 1957, p. 353) concurs when he states that the projective and integrative systems are capable of integrating sensory signals which reflect redundancies in past behavior but these signals must proceed to the representational level to be selectively connected with the appropriate activity and to be assigned significance or purpose. He sums up this point of view as follows:

Representational mediators provide a mirror of outcomes of past behaviors in relation to stimuli which produced them -- hence the significance of signs of the not-here and not-now ... [including] a reflection of the redundancies within the organism's own past experience and behaviors. (Osgood in Carterette, 1966, p. 212).

Behavior and experience vary with context producing change in meaning or significance of words which stand for this experience.

With all contextual factors equal or absent, a fragmentary sub-set of sensory signals will tend to elicit a hierarchy of alternative sensory completions in strict proportion to their frequency of pairing with this input in past experience (Osgood in Jones, 1957, p. 388). This situation is indicated to the left in Figure 5. As suggested to the right of this figure, contextual variables are seldom absent. If a relevant motivational state is present, it will both tend to exaggerate the most probable integrations as an energizer and tend to select certain integrations as

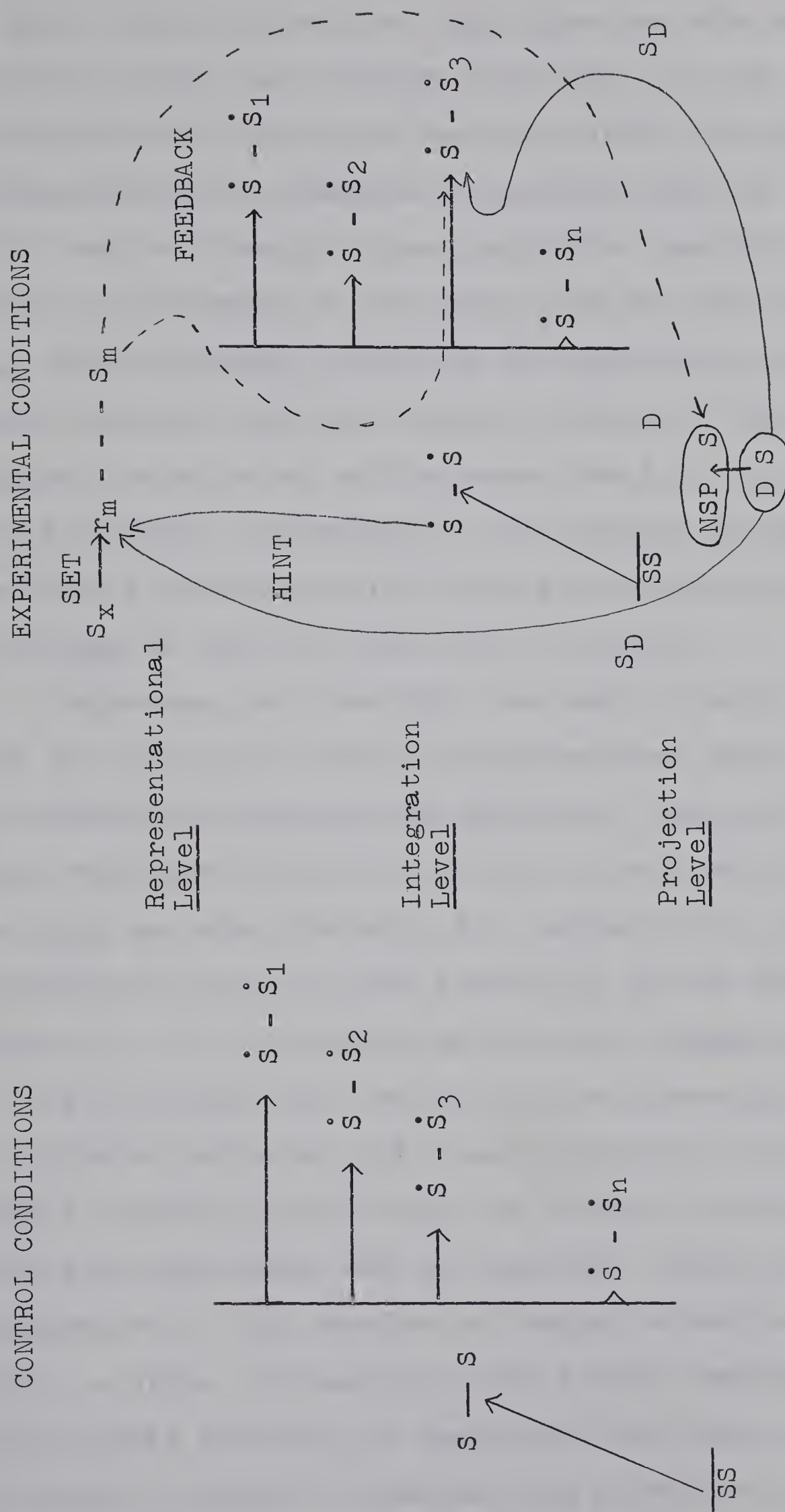


FIGURE 5

FEEDBACK FROM REPRESENTATIONAL TO SENSORY INTEGRATION SYSTEMS
(Osgood in Jones, 1947, p. 389)

a cue. The cue effects of this drive can also have another indirect effect upon sensory selection. To the extent that this drive has previously been associated with certain representational mechanisms or meanings and not others it will tend to "tune up" these particular cognitive processes. This is illustrated by the arrow from DS (drive system) to r_m . But contextual conditions (as previously defined) can also set these cognitive states in motion. This is known as set and is indicated by the arrow from S_x to r_m . Finally, the incomplete information in the stimulus display itself may have a selective effect upon alternative meanings. The term hint is used for this sort of control.

Drive-cue, set, and hint, are ways in which meaning can be "tuned up". Since representational mediation processes are cue-producing reactions, these self-produced cues participate in the selection of overt encoding responses but they are also available for feedback into both the integration system and the projection system (NSPS) (see Figure 2). To the extent that sensory integrations persist during the inspection, recognition, and meaningful decoding of stimulus patterns, the stimulus effects of such meaningful decoding should also, via feedback, become associated with, and hence tend to "tune up", these sensory integrations. This results in "paying attention" (Church, 1963, p. 128). In language, this process results in the differential selection of meaningful associations to stimuli (symbols) depending upon situational context.

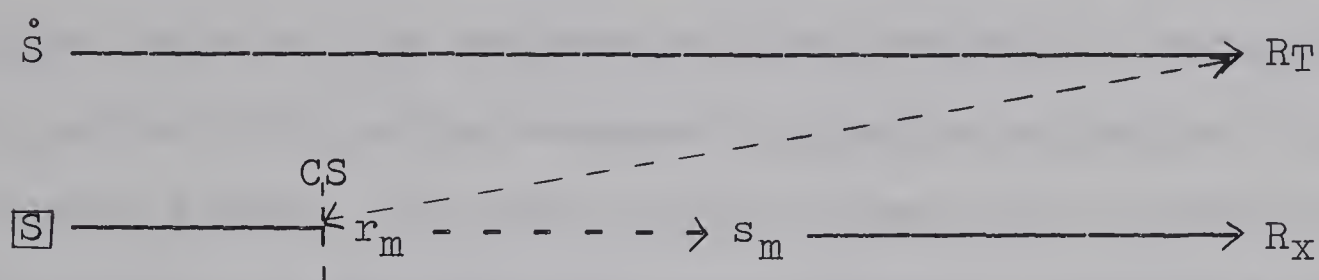
The limitation placed upon this view of meaning is that the mediational process must include some part of the same behavior produced by the original object or significate if it is to represent the object.

As already indicated, the associations which produce the representational mediation process must pass through a screening procedure (the thalamic process in the Cannon-Bard Theory or the projection and integration levels in Osgood's model). As illustrated in Figure 6, the meanings which different individuals have for the same signs will vary to the extent that their experiences and behavior towards the things signified have varied. These behaviors will vary in part as a result of the context within which the sign or symbol is used. Consequently, the development of signs and assigns will be a function of context. Context thus acts as a screen (CS) for the development of meanings of signs and assigns. Meanings of the same signs (words and concepts) will vary as a function of context and in varying serve as differential cues for response.

This screen, in practical operational terms, is the context in which the symbol is used. In the case of verbal symbols this contextual screen is the situation or the language community within which words are learned and used. As suggested by Whorf (1956, p. 235) each structured situation or language community determines the defining qualities of words it uses. Also, certain "affective parcels" become attached to symbols. In effect,

A

Decoding Sequence Meaning Encoding Sequence



B

Decoding Sequence Meaning Encoding Sequence

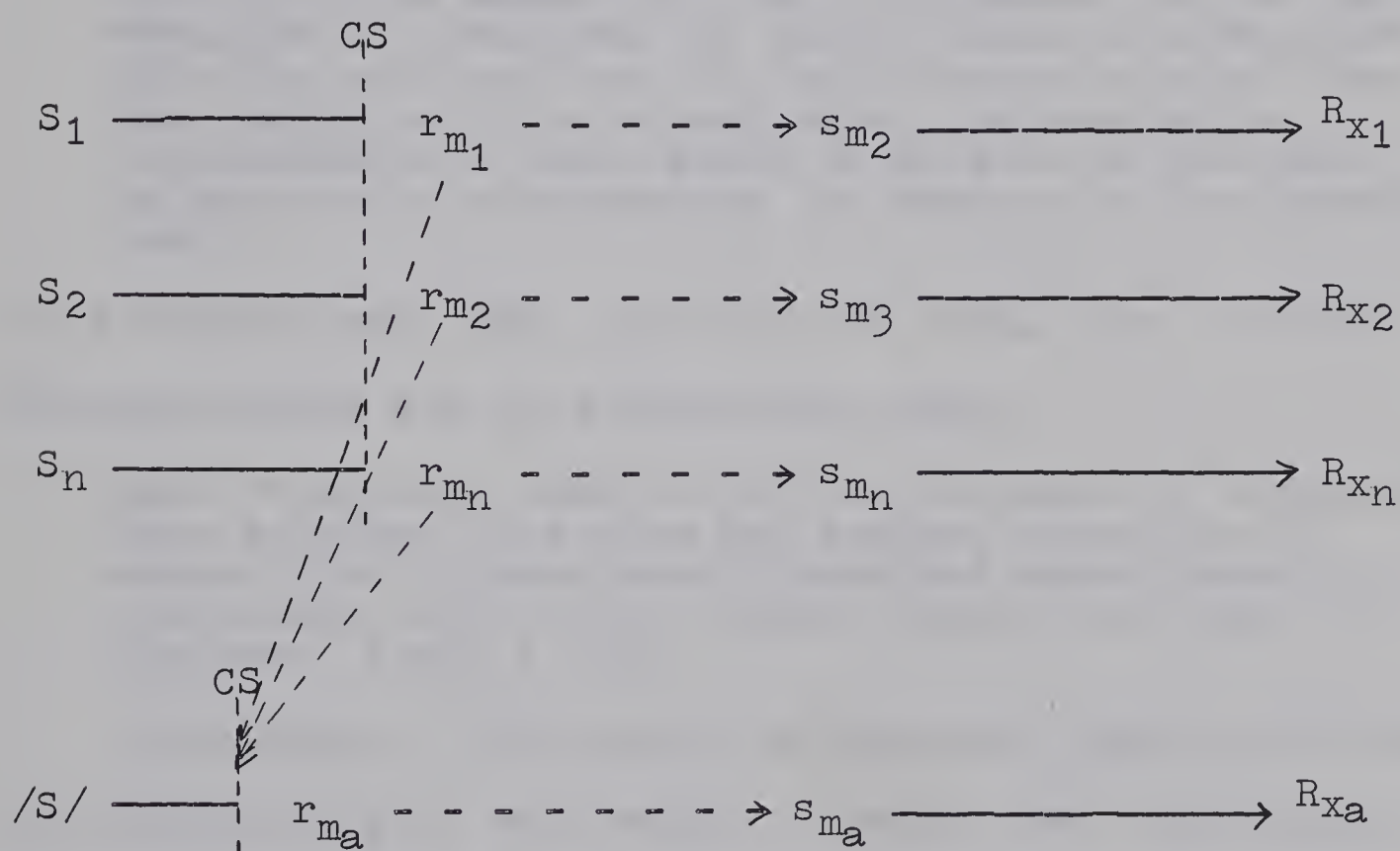


FIGURE 6

SYMBOLIC ACCOUNT OF THE DEVELOPMENT OF SIGN PROCESSES
AND THE INFLUENCE OF CONTEXTA. DEVELOPMENT OF A SIGN
B. DEVELOPMENT OF AN ASSIGN
(After Osgood, 1957, p. 7)

this context screens the kinds of associations available for words, creating a unique kind of connotative meaning for each context. This "meaning" is stored in the inter-stage phase of the representational mediation process and is called into action whenever a similar situation or context arises. In neurological terms this process is the action of the neocortex upon stimuli integrated by the hypothalamus resulting in a release of emotion and motivation (meaning).

Salomon (1966, p. 50) agrees when he says:

... context embraces more than merely the surrounding words and the manner of their utterance; in the last analysis it comprises the entire state of affairs at the time and the place of the utterance and all that has led up to it -- at any rate, the cumulative consciousness of this state of affairs on the part of whoever is interpreting the meaning of the symbols used.

This doesn't mean that just because words look or sound the same there are no differences there:

Most of the big semantic shifts recorded by etymologists have resulted from slow and gradual accretion of minute bits of meaning-differential contributed by individual users of the words through the years. (Salomon, 1966, p. 50).

Knowledge of this factor in language ought to decrease the possibility of what might be called the etymological fallacy, the fallacy of holding that the earliest known meaning is the right one and later ones are impurities.

Salomon (1966) argues that language, being the flexible instrument it is, will generate difficulties for literal transference of meaning between linguistic communities at any level. The most difficult, because the least

palpable, of these obstacles consists of that accretion of associations over and beyond denotation and defining qualities. These associations -- ethical, ethnic, political, economic, esthetic, and so forth -- "may vary locally even within a single linguistic community; [where they] form an important part of the semantic freight carried by a verbal symbol ..." (Salomon, 1966, p. 136).

For Malinowski the meaning of any linguistic unit consisted in its interrelations with its environment:

... exactly as a single word is -- save in exceptional circumstances -- meaningless, and receives its significance only through the context of other words, so a sentence usually appears in the context of other sentences and has meaning only as a part of a larger significant whole. I think it is very profitable in linguistics to widen the concept of context so that it embraces not only spoken words but facial expression, gesture, bodily activities, the whole group of people present during an exchange of utterances and the part of the environment on which these people are engaged. (Malinowski, 1935, p. 22).

He put forward a scheme for a two-fold "contextual definition of each utterance":

in the first place an utterance belongs to a special context of culture, i.e. it refers to definite subject matter But side by side, with this context of culture or context of reference, as it might also be called, we have another context: the situation in which the words have been uttered. (Malinowski, 1935, p. 22).

Vygotsky (1962) in describing inner speech, remarks on the preponderance of the sense of a word over its meaning. The sense of the word is the sum of all the psychological events aroused in our consciousness by the word. Meaning is only one of the zones of sense (connotative meaning), the most precise zone. A word acquires

its sense from the context in which it appears; in different contexts it changes its sense.

Vinacke (1951) contends that a symbolic response does not have a fixed permanent meaning but represents a momentary focusing of experience upon a particular stimulus situation, and placing the stimulus in a context of greater or lesser inclusiveness.

Both Skinner (1936) and Carroll (1944) have emphasized that the problem of describing verbal behavior, as well as the problem of meaning, reduces to the problem of describing the strengths (or latencies) of verbal responses under various stimulus conditions; this applies not only to the speaker but also to the hearer. Miller (in Stevens, 1951) has been particularly concerned with the effect of verbal context, that is, with the interdependencies between the responses in the speech flow. Werner and Kaplan (1950) have shown that the acquisition of meaning through verbal context is a result of the conditions under which the association was learned and reinforced.

Contexts (school subject areas) are therefore held to generate their own specific associations and unique patterns of connotative meaning. These patterns of meaning are the subject of this study and are measured by the Semantic Differential.

Linguistic context has been considered to be important not only in the formation of associations, but also in the contribution to the meaning of words in ordinary

communication. "The relationship between linguistic (syntactic) context and meaning has received some experimental attention, but has not yet been adequately explored" (Creelman, 1966, p. 139). Deese (1962) found a close relationship between the distributions of associations and the form-class of words used as stimuli. He thus concluded that associative meaning is determined by structures similar to the conceptual schemes which define form-class. These make it possible for English speakers to use words of different classes in appropriate positions in sentences. It therefore appears that there is a link between grammar and meaning.

Cofer has conducted a number of studies on the effects of context upon a variety of variables. Cofer and Shepp (1957) found that the recognition of a word was facilitated by its relationship to the preceding word in the context in which it was presented. Howes and Osgood (1954) viewed association as a function of the combination of probabilities of a particular word's appearing in various linguistic contexts. Flavell and Flavell (1949) substantiated Howes' contention in an experiment in which subjects were asked to match words for similarity of meaning, relatedness, and associative strength.

"Meaning" context studies have led Flavell (1961) to the conclusions that the meaning of a sign (word) has at least two components: (a) a representational process

reflecting the attributes of the referent itself, (b) a representational process reflecting the attributes of nonreferents frequently associated with the sign. Kincaid, Bousfield, and Whitmarsh (1962) suggested that the verbal conditioning of a response to a stimulus involves not only the conditioning to the stimulus word, but also a simultaneous conditioning to the composite of verbal responses to the word. Osgood (1956) concurs with this conception of previous associations and their influence upon the generalization of subsequent conditioning. Bettinghaus (1963), using the Semantic Differential, found that changes in meaning for adjectives and nouns depend upon the meaning of the words with which they have been associated as well as upon their initial meaning.

Situational context studies have had implications for meaning also since they seem to show the operation of some variable other than direct association. The effects of context upon processes such as conditioning, association, and recall are such that results and explanations obtain only when experiments are simple and therefore "... generalizations from these results to more complex situations are not tenable" (Creelman, 1966, p. 142).

This type of context ... called situational context -- as opposed to linguistic context -- has obvious effects upon ... the meaning of words ... and embraces a vast area which seems to have been almost untouched experimentally. (Creelman, 1966, p. 142).

Underwood, Ham and Ekstrand (1962) attempted to study the effects of context changes upon retention. Fluckiger

(in Creelman, 1966, p. 142) found changes in the meaning of stimulus signs and their assigns (as indicated by their Semantic Differential ratings) as a result of associating them within a story context. Sundberg's (1964) results are suggestive of the complexities in the investigation of meaning. In developing a test of implied meanings, he showed that meaning inferred from spoken statements was not independent of such variables as voice quality and emphasis.

The effect of context has been considered in educational as well as psychological studies. Werner and Kaplan (1952) studied the ways in which children of various ages attribute meaning to a word with reference to contexts in which it appears. They state that the process of signification involves the interdependence of two semantic aspects; i.e., word meaning and sentence meaning. In early language behavior, word meanings are far more inclusive than conventional connotation. These words have as their referents situational contexts rather than delimited objects (Werner & Kaplan, 1952, p. 15). They conclude that the high degree of stability of abstract symbols on their test indicates that the older child has learned to differentiate between areas or contexts in which relatively concrete symbolism is in order and other contexts where a hypothetical attitude is required for adequate performance (Werner & Kaplan, 1952, p. 118). Vinacke (1951) mentions seven studies which show that children's

concepts are closely related to their experience or the context within which these concepts were learned.

In a definitive study of children's meaning vocabularies Russell (1954) shows how meanings develop and change. He concludes in part that: "... although there is fairly consistent development from year to year, gains in vocabulary scores fluctuate considerably from grade to grade and from subject to subject" (Russell, 1954, p. 372). This finding once more suggests the influence of the situational context upon the development and use of word meanings.

IV. THE SEMANTIC DIFFERENTIAL

The meaning of meaning is agreed to be multidimensional. The measurement of one dimension of meaning, variously called connotative, affective, or emotive meaning has been attempted by several investigators. Cliff (1959; 1960) has shown that intensive adverbs multiply the connotations of evaluative adjectives. Using scaling methods and factor analysis, he was able to develop a quantitative equation for predicting the value of an adverb-adjective combination from the component words. Howe (1962) found a similar relationship between adverbs and adjectives. Lilly (1964), using adjective-noun combinations, found that there were different rules of combination depending on the evaluative nature of the individual words. These studies all involved linear scaling, the method of successive

intervals (Diederich, Messick, & Tucker, 1957) and thus explored only one possible dimension of affective meaning.

To date the most sophisticated and widely used instrument to study the connotative dimension of meaning has been the Semantic Differential, developed and extensively tested by Osgood and his associates (Osgood, 1957). Osgood begins by postulating a semantic space:

... a region of some unknown dimensionality and Euclidian in character ... [and furthermore] ... each semantic scale in this instrument, defined by a pair of polar adjectives, is assumed to represent a straight line function passing through the origin of this space. (Osgood, 1957, p. 25).

A sample of these scales represents multidimensional space, the more representative the sample, the better defined the space.

In differentiating the meaning of a concept, a subject judges the concept against a series of scales; eg.,

FATHER

happy ____: ____: x: ____: ____: ____: ____ sad
hard ____: x: ____: ____: ____: ____: ____ soft, etc.

Each judgement represents a selection among a set of given alternatives and serves to localize the concept in semantic space. The point in space which serves as an operational definition of meaning has two essential properties -- direction from the origin, and distance from the origin, which Osgood identifies with the quality and intensity of meaning respectively (Osgood, 1957, p. 26).

At this point, Osgood makes the assumption that there is some finite number of representational mediation reactions

available to the organism and that the number of these alternative reactions (excitatory or inhibitory) corresponds to the number of dimensions or factors in the semantic space. Direction of a point thus corresponds to what reaction is elicited, while distance from the origin corresponds to the intensity of reaction.

This position limits the definition of meaning as measured by this procedure. In fact, Osgood states that:

The meaning of "meaning" for which we wish to establish an index is a psychological one -- that process or state in the behavior of a sign-using organism which is assumed to be a necessary consequence of the reception of sign-stimuli and a necessary antecedent for the production of sign processes. (Osgood, 1957, p. 9).

Figure 7 illustrates an attempt to coordinate the semantic space and mediation models. The sign is represented as a point in n-dimensional space, (three dimensions in this case). As a point in space, the sign has projections onto each of the dimensions. The magnitude and direction of the coordinate on each dimension is estimated from the direction and intensity of the subject's judgement on those scales of the Differential representing this dimension. This means that the coordinate is a reflection of the representational reaction (r_m or \bar{r}_m) elicited as a representative of this dimension. The lower portion of Figure 7 represents the meaning of the sign as a simultaneous hierarchy of representational reactions with the intensity of evocation varying as follows $r_{m11} > r_{m1} > \bar{r}_{m111}$. What has been done:

... is to divide the total representational mediation process into a set of bipolar components, the meaning of a sign corresponding to the pattern and intensity with which these components are elicited. (Osgood, 1957, p. 28).

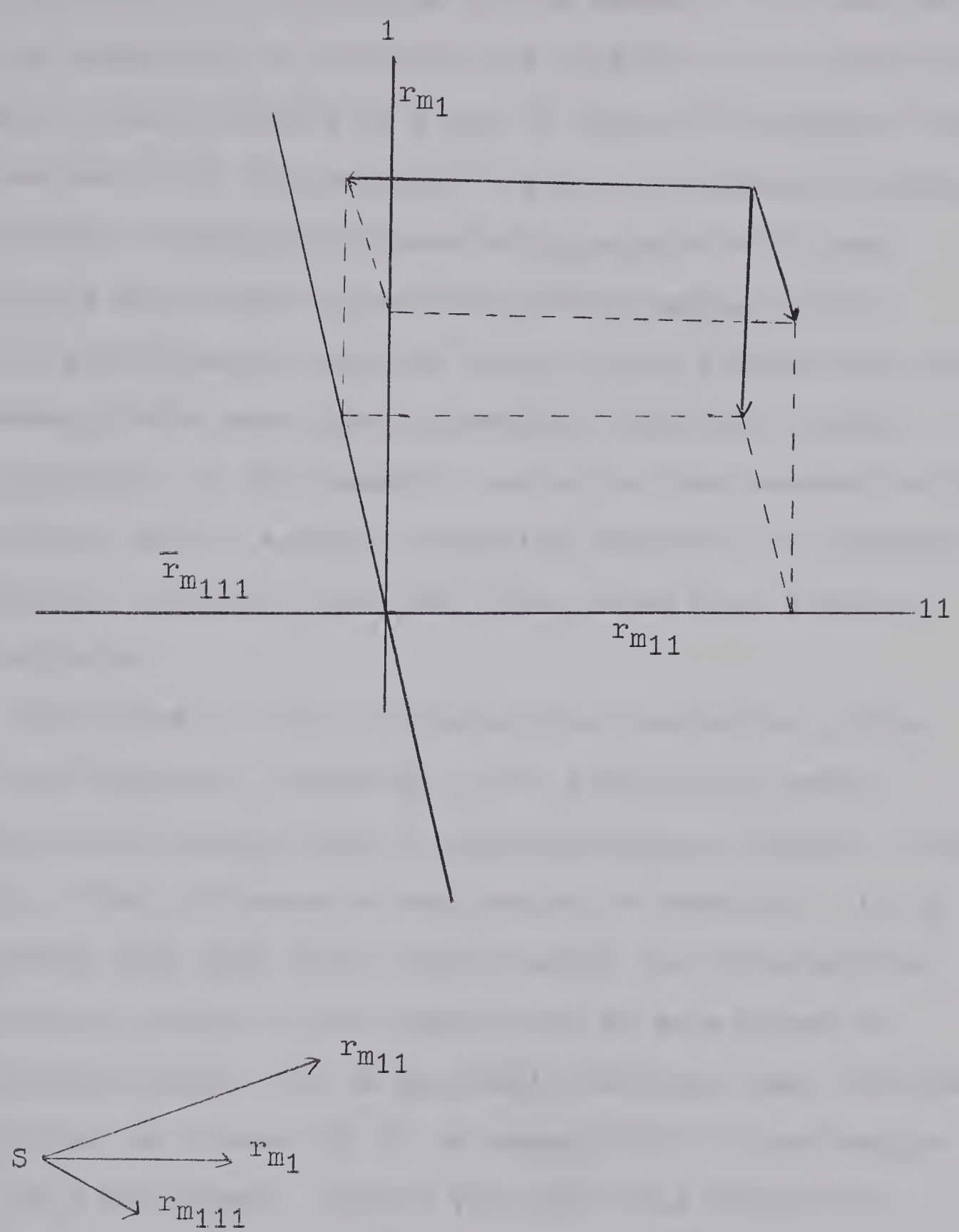


FIGURE 7

ASSUMED RELATION BETWEEN MEDIATION
AND SEMANTIC SPACE MODELS
(Osgood, 1957, p. 28)

Osgood's theoretical position regarding the procedure of the subject in responding on the Semantic Differential can be summarized as follows: the location of a concept in semantic space defined by a set of factors is equated with the evocation by the concept of a set of component mediating reactions, direction in space being equated with what mediators are evoked (from reciprocally antagonistic pairs) and distance from the origin being equated with how intensely (with what habit strength) these are evoked. Each position on the semantic scales is thus assumed to be associated with a complex mediating reaction, the dominant components depending upon the polar terms and intensity of response.

This view of the representational mediation system and the linguistic indexing of its functioning gains support from recent work in neurophysiology related to the study of the influence of motivation on behavior. It is concerned with what Hebb (1955) called the "nonspecific projection system" of the brain stem as an arousal or energizing system. It is generally believed that cortical cells must be "tuned up" to be susceptible to excitation via the direct path. Osgood has used this notion in discussing the formation of sensory (S - S) and motor (R - R) integrations (Osgood in Jones, 1957, p. 367). This is illustrated in Figure 8 where sensory inputs to the organism (S_1S) must be viewed as taking two paths toward the cortex: (1) direct specific projection onto

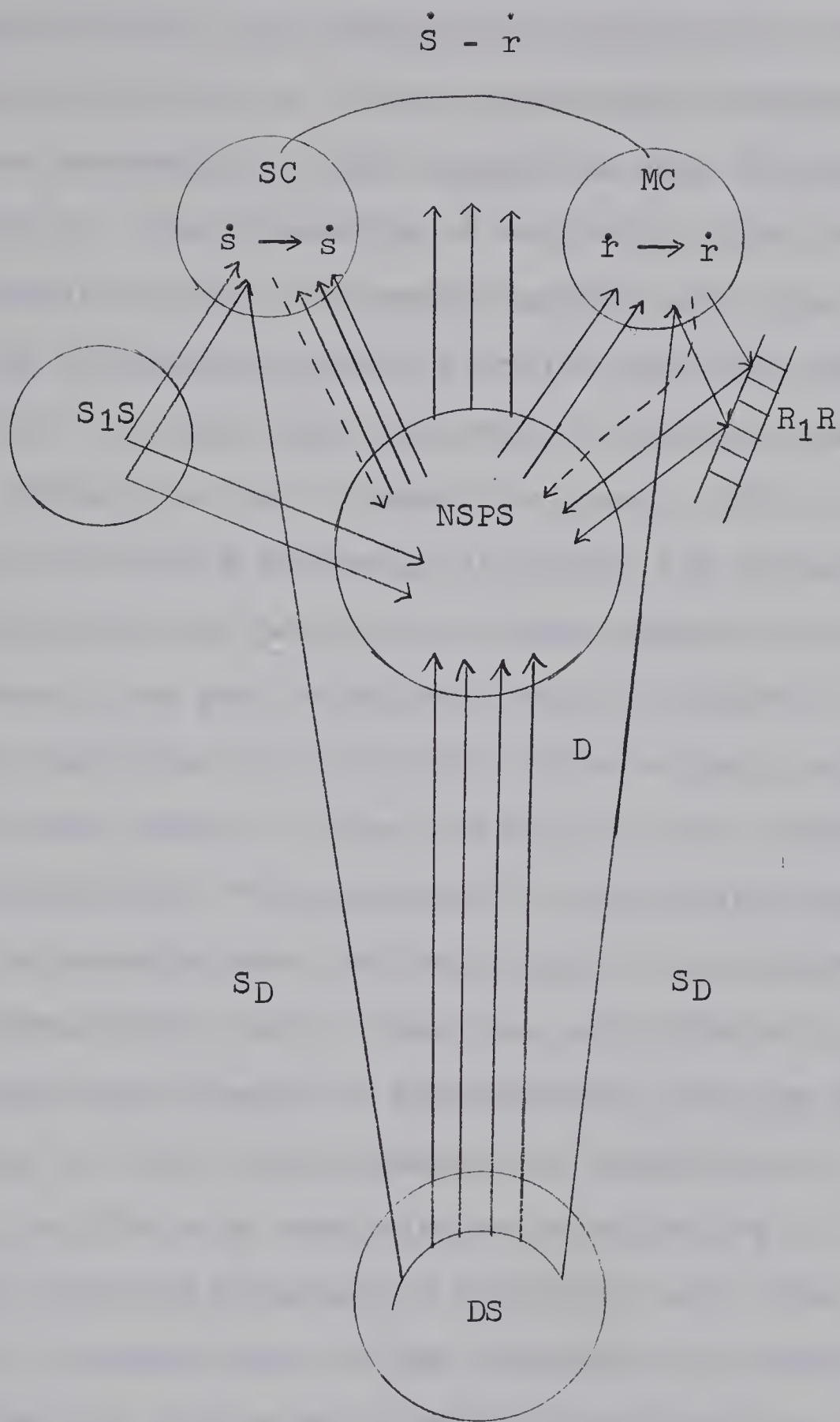


FIGURE 8

NEUROPHYSIOLOGICAL HYPOTHESIS
RELATING MOTIVATION TO BEHAVIOR
(Osgood, in Jones, 1957, p. 368)

appropriate sensory cortical areas (SC), and (2) indirect channeling into the nonspecific projection system (NSPS), from which there is diffuse projection throughout the cortex generally. (This concept is also illustrated in Figure 5). The intensity of excitation from this nonspecific projection system presumably depends both upon the intensity of the momentary external stimulus input and most importantly: "... upon its own level of excitation as determined by internal factors" (Osgood in Jones, 1957, p. 369). This functioning admirably describes the operation of the representational mediation process wherein associations garnered from past experience and the nature of the stimulus (the significate or its sign) evoke certain internal responses leading to the encoding of overt behavioral reactions which "take account" of the thing signified. The representational mediators can be considered to consist of "advance-avoidance" reactions of different intensities. The emotional charge of associations from the projection system is thus either enhanced or inhibited by the cortex. This results in a particularistic affective or connotative state becoming attached to linguistic and other stimuli. Direct implications for the influence of context are apparent in this view of behavior and meaning.

Looking at the internal factors in this model of behavior we see that Osgood has indicated the drive system (DS) as one source of stimuli which have their origins in the organism and vary in intensity with conditions of

need. These might be considered environmental or contextual factors entering into language behavior. As shown in the figure these stimuli take two paths to the higher centers, one direct and the other via the non-specific projection system. This explains the distinction made by Hull (1943) and other behaviorists between the cue effects of drives (S_D) and their energizing effects (D).

Since this behavioral system deals with hierarchies of alternatives (see Figure 3) the multiplicative relation postulated by Hull (1943) and more recently Farber and Spence (1953) explain the probabilities of occurrence of such alternatives. In other words, the effect of increasing drive level (as under the contextual conditions that exist within the various language communities) is to increase the probability of certain reactions or responses. In dealing with mediational learning such as that in language behavior, the facilitation or "tuning up" of the representational system via the NSPS becomes extremely important. As Osgood (in Jones, 1957, p. 371) concludes, this function has "... a maximal effect upon the learning of S - R relations, including symbolic processes." The affective states attached to concepts by the representational system are indexed by the Semantic Differential.

The raw data obtained with the Semantic Differential are a collection of check marks against bipolar scales. This entire set of raw scores may be represented as a rectangular solid as shown in Figure 9. Each cell in this

matrix of data represents the judgement of a particular concept against a particular scale by a particular subject; each of the n slices represents the complete judgements of a single subject; each of the m columns represents the judgements by all subjects against all scales for a single concept; and each row represents the complete data for each of the k scales, all subjects' ratings of all concepts against each scale (Osgood, 1957, p. 86).

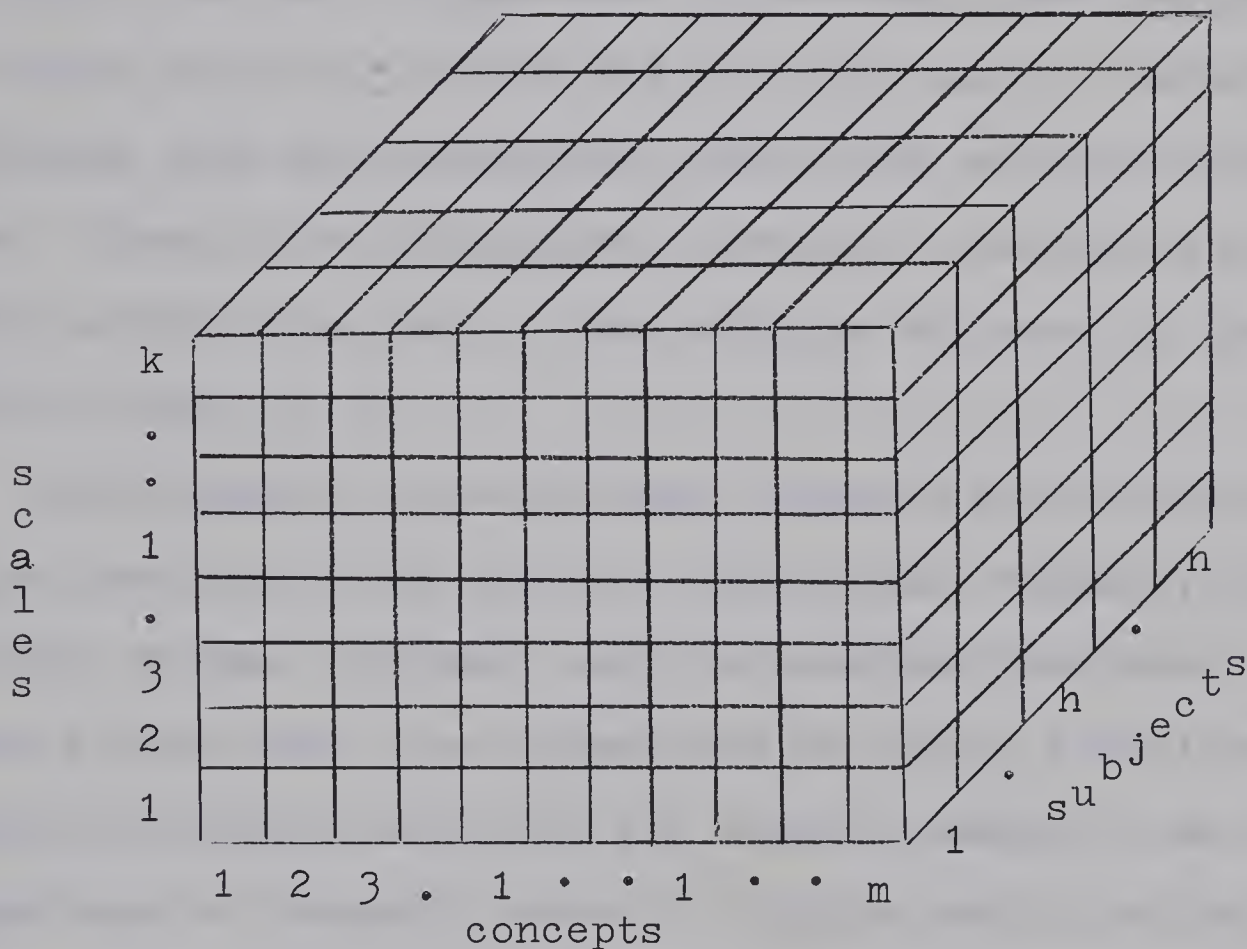


FIGURE 9

RECTANGULAR SOLID OF DATA
GENERATED BY THE SEMANTIC DIFFERENTIAL
(Osgood, 1957, p. 86)

In order to determine the dimensions of the "semantic space" a factor analysis of the intercorrelations among

the adjective scales, computed across subjects and concepts, is performed (Osgood, 1957, ch. 2). Evidence from a large number of different factor analyses of SD data suggests that there are three primary factors in the domain of affective meaning (Osgood, 1962; Osgood, 1957, ch. 2). The first and most important factor is called an evaluative (E) dimension and is characterized by scales such as good-bad, pleasant-unpleasant, and positive-negative. The second factor is called potency (P) and is characterized by scales such as strong-weak, light-heavy, and hard-soft. The third factor is called activity (A) and is characterized by scales such as active-passive, fast-slow, and excitable-calm. These three factors are mutually independent and often account for most of the reliable variance in the data (Lilly, 1965, p. 5).

Considerable cross-cultural research employing the SD has been done with subjects from Japan, Finland, Greece, Britain, Norway, Holland, and the American Southwest. These studies have been summarized by Osgood (1962) and support the idea that there are a small number of major dimensions in "semantic space." In the testing of Whorf's hypothesis of language relativity, the cross-cultural similarities were found to be more impressive than the differences identified. This finding does not disprove the language relativity contention for two major reasons. First, these studies were concerned mainly with determining the parameters of connotative meaning; i.e., the

dimensions or factors which emerge from responses to concepts. The internal differences between factors were not analyzed. Second, differences in connotative meaning are powerfully affected by context but there was no attempt made to control this factor as a systematic variable. Therefore only a generalized measure of connotative meaning was obtained.

Concept areas other than words have been used in SD research. One important finding of research using different concepts was that factor loadings of the scales do not remain constant across different concept areas. The nature of the factors also tends to reflect the concept domain studied (Lilly, 1965, p. 6). Osgood (1962) has called the phenomenon of cross-concept instability concept-scale interaction. This concept-scale interaction, it is hypothesized, should hold true for the same concepts in different situational and linguistic contexts. The most systematic study of concept-scale interaction was done by Tanaka et al. (1963) and involved Japanese and American subjects. The authors concluded that the characteristic attribute of a concept exerts a selective influence on SD judgements by producing a rotation of scales toward the dominant attribute.

With respect to subjects used in SD studies, it is suprising to find, in contrast to the variety of experiments with adults (mostly college students), practically no research involving children. Donahoe (1961) used four

groups of 50 subjects each, in the age groups 7, 9, 12, and 22. Ten concepts were rated on nine SD scales. There were significant effects due to age level, semantic factors, and age by factor interactions. These results suggest that the semantic space for children may be somewhat more restricted than it is for adults.

One other study was concerned with the change in connotative meaning, as measured by SD ratings, as a function of age. Maltz (1963) had children rate seven concepts on nine adjective scales. Subjects were second, fourth, and sixth grade children and a college sample. The results suggested that the SD is sensitive to changes in connotative meaning, since there were significant differences between groups when tested by means of chi-square. It was also shown that as differences in ages increased, there were more significant differences between groups. Since the data were not factor analyzed, there was no information as to the dimensionality of "semantic space."

In the area of personality, Zax and Benham (in Lilly, 1965, p. 11) studied the connotative meaning of Rorschach inkblots as perceived by fifth and sixth grade children. Using direction of ratings only, consistent differences were found. No sex difference was found but children made more positive and fewer neutral evaluations than college students.

The SD has also been used to measure evaluative

meaning in condition studies with children. Two studies using fifth and sixth grade children (DiVesta & Stover, 1962; Sheetz & Naumoff, 1963), have shown that evaluative meaning can be "conditioned" to previously neutral stimuli. Studies such as these support the contention that meaning is a function of variables such as context and can be conditioned by these variables.

The latest and most rigorous developmental study of SD (Lilly, 1965) used subjects from grades three, five, six, and nine. The results for this study suggest that the primary dimensions of affective meaning for children as young as grade three were very similar to those for adults. The concepts employed were neutral in respect to concept area but nonetheless these findings indicate that children use or have available the same mediating responses as adults; therefore, they are generally as much affected by the influence of situational and linguistic context as adults.

In summary, the SD is purported to be a measure of the mediational processes postulated to underlie the connotative (affective) meaning of words. Osgood (1957) believes that the presentation of a "concept" in conjunction with a bipolar scale gives rise to a mediational process which is stable enough to give reliable and useful results. Osgood is concerned with variations in this mediational process in terms of direction and intensity with respect to these bipolar scales. He postulates that any mediational state

can be fractionated into a number of distinct mediating reactions, each of which can take either a positive (excitatory, advance) or negative (inhibitory, avoidance) form. The task of research with the SD is to identify the independent dimensions along which mediating reactions may vary and thereby to define the "meaning" of concepts and subsequently to indicate change in this quality of words.

Measures of connotative meaning are particularly appropriate for indexing differences in language structures which generate "world views" since it is the defining qualities (linguistic connotation and affective responses) which largely distinguish between "views" of the referent. This aspect of meaning is also the most amenable to contextual influence by virtue of its locus within the neurophysiological and psychological functioning of the individual. These assumptions thus provide the bases upon which the Semantic Differential was chosen as the instrument for this study.

V. AN INVESTIGATION OF THE EFFECT OF CONTEXT UPON THE CONNOTATIVE MEANINGS OF WORDS - A PILOT STUDY

To test the general hypothesis that situational and linguistic context as represented by school subject areas will influence the connotative meaning of words thereby producing a differential "world view" a pilot study was conducted by the investigator (Evanechko, 1967). The study was based on the application of the SD to the judgements of certain

significant concepts in elementary social studies and literature (fiction) material by grade six students. Ten concepts and twenty scales were employed.

Forty-two grade six students from two classrooms in two schools in Leduc County, Alberta, were selected for the study. The Ss were randomly assigned to each of the two forms of the instrument, making twenty-one Ss for each test. This random assignment permitted the assumption that the groups were equivalent precluding the necessity for administration of both forms to each group.

In an attempt to manipulate experimentally the independent variable in the study, context, the Semantic Differential was administered under two conditions (within two contexts). The contexts, social studies and literature classes, were established by making the test situation an integral part of the ongoing activities in these elementary school subject areas. A rigid protocol was followed in all cases for introducing and administering the task.

A principal axes factor analysis was conducted which identified six factors and these were rotated toward simple structure by the use of the normal varimax criterion (Kaiser, 1958). In the analysis, the concepts were collapsed into the subjects to produce a measure of meaning across scales only. This permitted the locating, in a global sense, of concepts in semantic space for each of the contexts. To compare structures, a factor match of the three principal factors was conducted employing the

Ahmavaara Factor Match Test (Ahmavaara, 1954).

An inspection was made of the varimax rotated factors to determine location of concepts within meaning space in the two contexts thereby producing evidence for later more detailed analysis. All six factors obtained were examined since they each contributed substantially to the total variance.

The principal scale factors identified were: Evaluation, Oriented Activity, and Potency, while the three pairs of secondary scale factors became: Activity-Novelty, Stability; Stability-Potency, Novelty; Complexity, Security. These factors were, in the main, of two kinds, those highly congruent (principal factors) and those almost entirely unique to each context (secondary factors). Polarization was greater in the social studies context particularly in the principal factors. Also, the number of high loading scales was greater in the social studies context indicating greater meaningfulness and breadth of meaning in this context.

The factor match produced evidence of near collinearity between axes of the major dimensions indicating their high congruence. An examination of these factors produced evidence of substantially different internal structure within each context. The secondary dimensions, being unique to each context, described the fine variations in meaning between the same words in different contexts, emphasizing particularly the "toughness," "danger," aspect of meaning in social studies as contrasted with the "simplicity,"

"uncertainty" aspect of literature meaning.

That the SD appeared to tap in a significant way the changes in meaning due to context demonstrated its value as a measuring instrument for this line of research. That there were changes in meaning between contexts provided empirical support for the language relativity hypothesis upon which the study is designed.

VI. SUMMARY

This chapter has presented a variety of evidence, both theoretical and empirical, to support the positions the investigator takes in regards to the several dimensions of this study.

First, a general survey of approaches to the study of meaning and the relation of meaning to reality was considered. It was shown that reality is believed to be a function of language and meaning. This view was shown to take its most positive form in the "Whorf Thesis" of language relativity. Investigators taking this position hold that people in different language communities organize reality differently according to the structures of the language they employ. Evidence was submitted to support the contention that complex societies such as ours must of necessity employ many "intralanguage communities" each of which is employed in a relatively specialized way. Finally, the application of this theoretical orientation to the subject areas in the elementary school was made.

It was hypothesized that the language in each subject area would reflect a somewhat unique form of reality through its representation of a particular version of this reality.

Second, the representational mediation process was discussed. It was shown that this process, predicated upon S-R formulations, serves to explain the manner in which meaning becomes attached to symbols through the association of these symbols with some part of the total behavior elicited by the object or concept signified. Furthermore, according to this process, these symbols are mediational because they become associated with appropriate responses to the thing signified. The frequency of association was shown to produce convergent and divergent hierarchies of instrumental acts illustrating the effect of context.

The distinction between denotative and connotative meaning was made. It was shown that it is the connotative dimension of meaning that is described in the representational mediation model of meaning and that it is this aspect of meaning that is indexed by the Semantic Differential.

Third, attention was given to context. Context was taken to mean the totality of conditions influencing linguistic behavior. These conditions were held to vary with the social, educational, and experiential backgrounds of language users. The affective dimension of context as

postulated by Arnold was discussed which led to an appraisal of the neural substrate of emotion and motivation. The view of the contextual influence upon behavior as a thalamic process was shown to be an alternate explanation of the representational mediation process. The concept of the screening influence of context was integrated into Osgood's model of the development of signs and assigns. Finally a number of pertinent studies of the influence of context upon meaning were summarized.

Fourth, the Semantic Differential, the instrument of the study, was discussed. The concepts of differentiation on a set of polar scales and the resulting semantic space were discussed. It was shown that this instrument was an adequate index of the functioning of the representational mediation process through its measurement of the affective or connotative dimension of meaning. Once again the neurophysiological basis for this process was discussed. A number of pertinent studies employing the SD were considered and significant results indicated. These included both studies of a general nature and those with children only. Finally the suitability of this instrument for the present study was indicated.

Fifth, the pilot study conducted as a prelude to the major study was reported. It was found in this minor study that the SD was suitable for use in the problem as hypothesized. Also, the study provided preliminary empirical evidence to support the hypothesis of the major study.

It is concluded that this review of literature constitutes an adequate basis upon which to organize an investigation into the effects of context upon meaning and the influence of different meaning states upon the language user's world view.

CHAPTER III

EXPERIMENTAL DESIGN

In this study meaning will be considered a representational mediation process. According to this view, words represent things because they produce in humans, as a mediation process, some part of the actual behavior towards things for which they are symbols.

The stimulus producing process, Figure 10, A, (rm - - - sm) generated during the decoding phase, is representational because it is part of the same behavior (RT) produced by the significate (S) and is thus its symbolic semantic property. It is mediational because the self stimulation (sm) (the encoding of the response) produced by making this short-circuited reaction can now become associated with any instrumental acts (Rx) which "take account of" the thing signified. The "taking account of" the significate results in a suitable or adaptive response (Rx) being evoked.

Osgood (1957) has designed a psychometric method, the Semantic Differential, for providing an index of the linguistic responses or the representational mediation process (see p. 59 ff.). The Semantic Differential endeavors to measure that dimension of meaning generally termed connotative or affective which is postulated to be the product of the representational mediation process. This measurement is formulated on the conceptualization

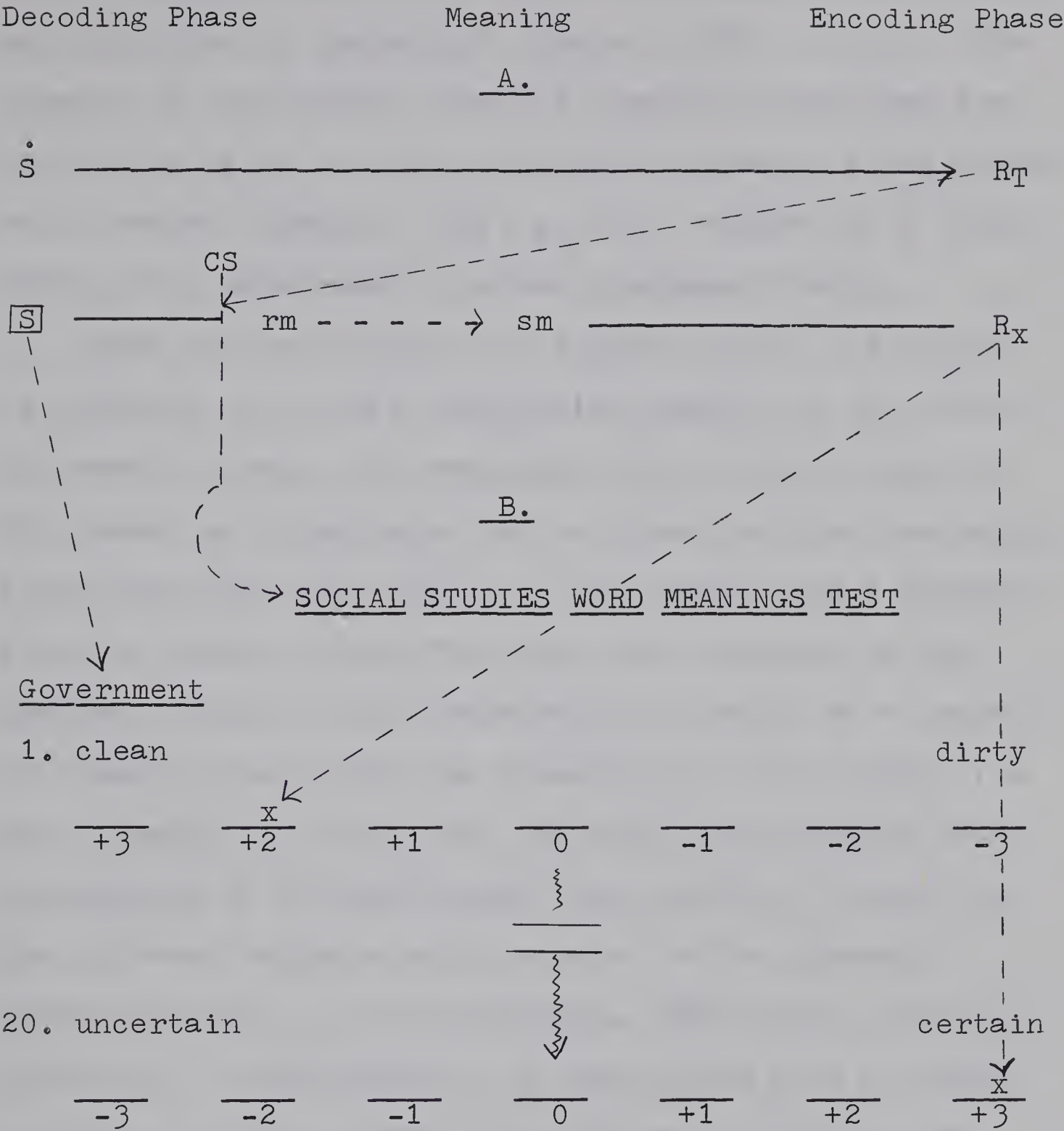


FIGURE 10

DIAGRAMMATIC REPRESENTATION
OF THE THEORETICAL RELATIONSHIP
BETWEEN THE RM PROCESS AND THE OPERATION OF THE SD,
WHEN CONTEXT IS THE DETERMINING VARIABLE
(Adapted from Osgood, 1957)

of a "semantic space ... a region of unknown dimensionality and Euclidian in character" (Osgood, 1957, p. 25). "The termini of the various possible semantic dimensions are defined by pairs of polar adjectives arranged along seven-point scales" (Manson, 1957, p. 71). Figure 10, B illustrates this measurement process diagrammatically.

When rating a concept on a given scale, the subject is believed to fix his connotative meaning of the concept in semantic space. By assigning the concept a point on the scale, he establishes both a direction from the origin, identified with the quality of the meaning and a distance from the origin, identified with the intensity of the meaning. Osgood (1957) equates the location of a concept in semantic space with the evocation by the concept of a set of mediating reactions, the direction variable being represented by the particular polar mediator evoked and the distance variable being equated to the intensity (meaningfulness) of the evocation. Each scale position, therefore, is postulated to be associated with a complex mediating process wherein the different mediators are related during the encoding operation to the various scale positions selected. According to the generalization principal Osgood contends that:

... the concept will elicit checking of that scale position whose dominant mediator component most closely matches in intensity the corresponding component in the process associated with the concept itself. (Osgood, 1957, p. 30).

In other words, the selected scale positions are co-ordinates

of the concept in semantic space corresponding to the coordinates in the measurement space, and are therefore functionally equivalent to the components of the representational mediation process relating to the concepts.

Figure 10 also diagrams the role of "context" in the representational mediation process (see p. 39 ff.). The meanings which different individuals have for the same symbols will vary to the extent that their behavior towards or experiences with the things signified have varied. These experiences will vary in part as a result of the context within which the symbol is used. Context thus acts as a screen (CS), (Figure 10, A) for the development and subsequent evocation of meanings of symbols. Figure 10, B represents the application of a particular context, a social studies situation, to the experimental evocation of linguistic responses arising from the representational process. It is contended that meanings of the same symbols will vary as a function of context and in varying serve as differential cues for response, and that the linguistic component of this response can be indexed by Semantic Differential scales.

Figure 10 is, therefore, a theoretical construct which illustrates the theoretical relationship between the concept of the representational mediation process and the functioning of the Semantic Differential in the indexing of resultant linguistic responses. Furthermore, and this is the central premise of this study, it identifies the

role of context in determining the development of the representational mediation process which is the general definition of meaning in this study. Finally, this model illustrates how the "world view" of language users is a function of meaning as influenced by context and how versions of this "world view" can be tapped by the Semantic Differential. Skinner (1957) sums up this view with the contention that when meaning is considered in this light we are no longer measuring the transient states of individual speakers, but the highly learned, well-nigh permanent, response tendencies built into these users of language by the process of social reinforcement. And in conclusion, the main point is this:

The Semantic Differential was not designed as a linguistic tool but as a psychological one -- to assess certain symbolic processes considered to occur in people when signs are received and produced. (Osgood, 1958, p. 192).

I. THE MEASURING INSTRUMENT

The Semantic Differential used in this study consists of twenty adjective scales (see Table I). Several considerations dictated the selection of the adjective scales and concepts. The first criterion was familiarity. Since the instrument was to be used with children in grade five, only frequently used words were employed (Table I). The Thorndike-Lorge (1944) list was used as the criterion. Second, the number of scales and concepts had to be large enough to define most of the possible ways that semantic

TABLE I
ADJECTIVE SCALES

Scale	Frequency ¹ (per million)		Major Factor Loading ²
clean - dirty	100+	31	evaluation
painful - pleasurable	(100)+	(100)+	evaluation
soft - hard	100+	100+	potency
light - heavy	100+	100+	potency
rough - smooth	50+	50+	potency
moving - still	(100)+	(100)+	activity
strong - weak	100+	50+	potency
fast - slow	100+	100+	activity
important - not important	100+		unassigned
kind - cruel	100+	46	evaluation
excitable - calm	(47)	50+	activity
large - small	100+	100+	potency
dangerous - safe	50+	100+	unassigned
bad - good	100+	100+	evaluation
steady - changing	50+	(100)+	unassigned
unusual - usual	36	50+	unassigned
ugly - beautiful	34	100+	evaluation
hot - cold	100+	100+	activity
complex - simple	13	100+	activity
uncertain - certain	50+	50+	unassigned

¹ Frequencies in parenthesis are for the stem of the word in the table.

² (Osgood, 1957; Lilly, 1965).

space (meaning) can vary. At the same time, the instrument had to be small enough so that the time required for rating was not prohibitive. A third consideration determining the selection of scales was the relation of adjectives to previously determined factors (Osgood, 1957; Osgood, 1962; Lilly, 1965). The concepts (Table II) were selected on the basis of the investigator's experience with the school subject areas being investigated: social studies and literature. The basic criterion for selection, after familiarity, was the significance of the concept in representing an area of meaning central to the contexts being investigated. The complete list of scales is given in Table I; the concepts are given in Table II. The Thorndike-Lorge frequencies are also given. Major factor loadings for the adjective scales as well as the linguistic category of the concepts are indicated. It is suggested (Thorndike & Lorge, 1944, p. xi) that words occurring in frequency greater than fifty per million should be taught to third-grade children. Therefore all of the words chosen (scales and concepts) could reasonably be expected to be familiar to fifth-grade children in the second half of their school term.

The polarity of the twenty adjective scales was randomly assigned; i.e., the placement of positive and negative adjectives at the ends of the scales was randomized as was the order of concepts. The order of adjective scales was the same for each concept in both forms of the instrument.

A different form of the basic instrument was used

TABLE II

CONCEPTS

<u>Concept</u>	<u>Frequency (per million)</u>	<u>Category</u>
government	100+	institution
land	100+	physical object
power	100+	abstract concept
wrong	100+	abstract concept
command	100+	verb
money	100+	physical object
honor	100+	abstract concept
kill	100+	verb
peace	100+	abstract concept
yourself	100+	person

for each subject area to help establish the situational context (see Appendix A). Each form was clearly labelled: Social Studies Word Meaning Test; or Reading Word Meaning Test. The term "reading" was used rather than "literature" because of its greater familiarity for elementary school children.

To provide some degree of control for linguistic context within each situational context, each concept was introduced for rating by a sentence (see Appendix B). The sentences for the reading context were randomly chosen from literature (fiction) selections in grade five readers recommended for Alberta schools. Sentences for the social studies context were randomly chosen from reference material recommended for use in the grade five social studies program. These sentences, it was assumed, would help generate a differential context situation for each form of the test. This context situation, it was further assumed, would be typical of that encountered by students during day-to-day linguistic activities in these subject areas.

Responses on the scales were transferred to special answer sheets so they could be scored by machine. These answer sheets, specially designed for this study, were scored by the IBM optical mark scorer which uses an optical scanning device to sense the darkest area in a predetermined section of the answer sheet. Responses are coded in accordance with their positions on the answer

sheets and automatically punched onto cards.

A seven-point rating scale was used since it was decided that this scale provided for sufficient discrimination regarding intensity of response and that it would allow for greater spontaneity of response than a scale with finer discriminations. Each concept was printed at the top of a separate test sheet. Each subject thus had ten answer sheets in all, ten concepts to be rated on twenty scales. Sample tests in each of the two forms are given in Appendix A.

II. FACTOR ANALYSIS

Factor analysis has been widely used in behavioral sciences as a means of identifying a minimal number of independent dimensions which will allow the description of a body of behavioral data (Kerlinger, 1965). It is, therefore, a method for determining the number and nature of underlying variables among a large number of variables; i.e., determining k underlying factors from n sets of measures, k being less than n :

The geometric model is that of m -dimensional Euclidean hyperspace. The variables under study are regarded as vectors (directed lines of specified length starting at the origin) in this hyperspace, and the first object of the analysis is to specify the co-ordinates of the termini of the vectors, in some arbitrary reference frame, in such a way that the size of the angles between the vectors will be inversely related to the degree of their relationship or similarity. (Carroll, 1959, p. 63).

Factor analysis provides a mathematical model which

can be used to describe certain naturally occurring relationships. A series of test scores or other behavioral measurements are intercorrelated to determine the number of dimensions or components the test space (the behavior measured) occupies and to identify these dimensions in terms of traits or other defining characteristics. The interpretations are done by observing which tests fall on a given dimension and inferring what these tests have in common that is absent from tests not falling on the dimension. Tests correlate to the extent that they measure common traits and therefore these tests define the nature and extent of the factors identified. By observing and analyzing the pattern of intercorrelations, the operation of the underlying traits or sources of variance can be determined.

Computational procedures are applied to determine the degree to which the variables (measures) account for variance in factors on the basis of their correlation to common traits (when part of the common factor variance is given over to the specific factor(s).) Results of computations are expressed in factor loadings which represent correlations between measures and factors in terms of magnitude and direction when factors are orthogonal.

From the standpoint of factor analysis, the variables under study in the SD are the adjectival scales; they constitute the dimensions along which the "meanings" (mediational processes represented by the confrontation

of scale with concept) are measured initially. The analysis is begun by computing a correlation matrix showing the correlation of each scale with every other scale. It doesn't matter how individuals rate concepts so long as they are generally consistent in their use of adjectives so that factors may be withdrawn. After the correlation matrix is calculated, the factor analysis is conducted. In this study, as in most recent SD investigations, the principal axes method of factoring was employed. This method, a common one with the advent of high-speed computers, takes out the maximum amount of variance for each factor, leaving the smallest amount of variance possible. This results in the smallest possible number of orthogonal factors.

There is a further step. The vectors which represent the several scales are simply "hanging in space" without indication of the basic dimensions of that space (Figure 11). But since the relations between vectors (correlation between scales) is invariant regardless of co-ordinates, we can rotate the co-ordinate frame of reference to a position which will delineate the primary dimensions of that space (Carroll, 1959, p. 65; Kaiser, 1958).

Figure 12 illustrates an orthogonal rotation for the reference frame used in Figure 11. It is seen that the five scales now fall into two factors: Factor I Evaluation (good, kind); Factor II Potency (large, strong) with

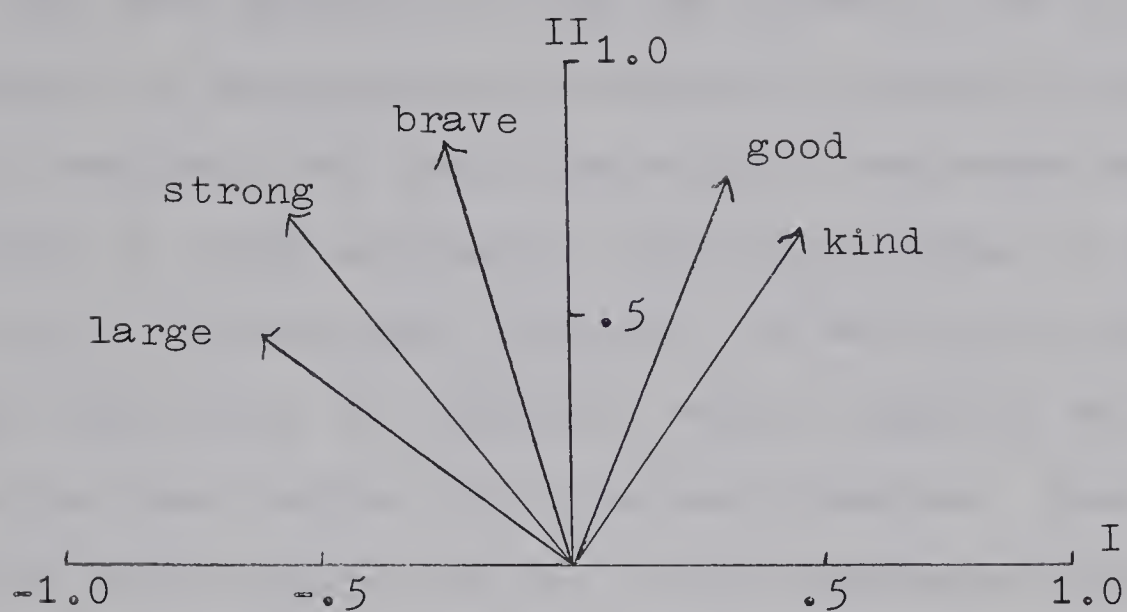


FIGURE 11

RELATIVE POSITIONS OF FIVE VECTORS
EACH REPRESENTING AN ADJECTIVAL SCALE
PLOTTED ON ARBITRARY CO-ORDINATES
(Carroll, 1959, p. 65)

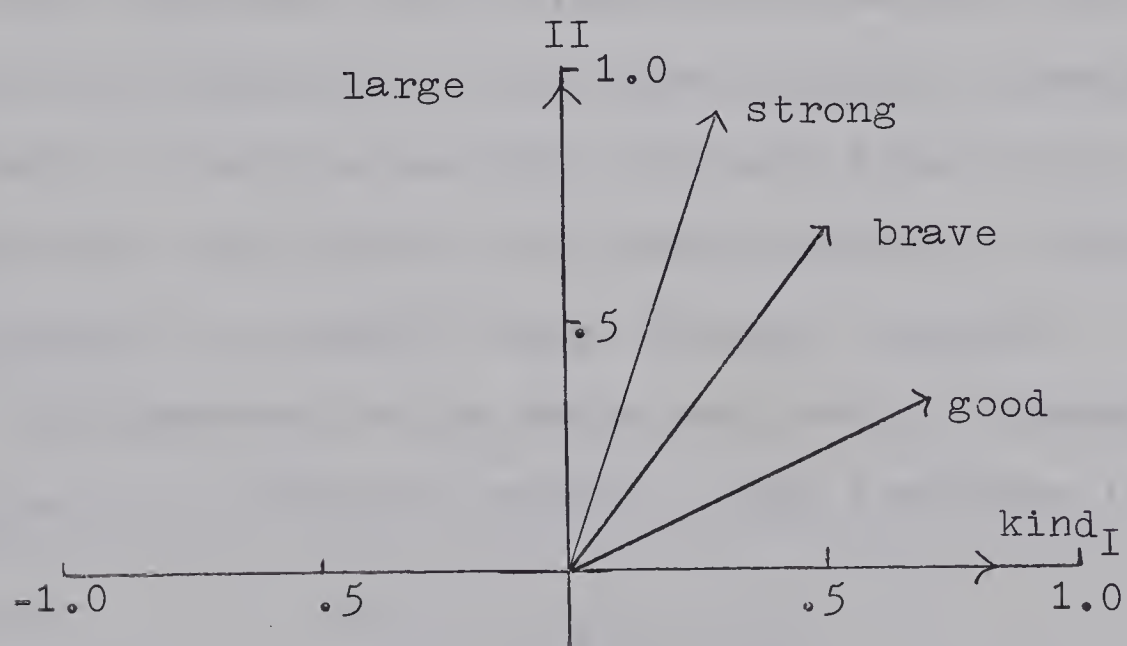


FIGURE 12

THE VECTORS OF FIGURE ELEVEN
ROTATED TO A MEANINGFUL REFERENCE FRAME
FACTOR I - EVALUATION; FACTOR II - POTENCY

"brave" partaking of both dimensions.

This study will employ the Varimax rotation process developed by Kaiser (1958).

The data gathered by the two forms of the SD were subjected to appropriate statistical treatment involving factor analysis and factor matching. Responses were analysed by using available computer programs in the Division of Educational Services, in Faculty of Education, at the University of Alberta. Factor analysis was by the principal axes method with Varimax rotation. Resultant factors were compared by use of the Ahmavaara Factor Match procedure.

Factor analysis on several levels was carried out and interpreted. The first analysis consisted of a summation over concepts and subjects to generate scale factors with analysis continued until eigenvalues reached unity. Second, an analysis of individual concepts, summing over subjects. Analysis was done for each form of the test separately, and factor structures compared to determine differences in semantic space between contexts.

An Ahmavaara Factor Match was used to determine the congruence of obtained factors. This procedure is defined as:

$$Cf_h = (A^1A)^{-1} A^1C$$

where A and C are factor structures to be compared and h is the factor in C while f is the factor in A.

III. EVALUATION OF THE SEMANTIC DIFFERENTIAL AS A MEASURING INSTRUMENT

Measurement instruments are evaluated against the criteria of objectivity, sensitivity, utility, reliability, validity, and comparability. In the case of the SD we are particularly concerned with the last three qualities named: reliability, validity and comparability. Evidence, both theoretical and empirical, will be summarized under each of the above criterial headings in evaluating this instrument and supporting its use for this study.

Objectivity

Objectivity is achieved when the operations of measurement can be made explicit and reproducible thus removing the influence of subjectivity. The SD can be, thus, considered to possess adequate objectivity since the procedures employed "... completely eliminate the idiosyncrasies of the investigator in arriving at the final index of meaning ..." (Osgood, 1957, p. 126).

Sensitivity

An instrument is sensitive to the degree that it makes discriminations commensurate with the units of the phenomena being measured; specifically, it should yield discriminations finer than common sense ones. In an early study involving the SD, Osgood (1957, p. 166) compared ratings of concepts with Haagen's (1949) scaling of adjectives. Results showed discriminations to correspond

well with common sense. Another approach to determining sensitivity, one having particular significance for this study, found that there was a marked difference between words on the potency factor when the linguistic context was the determining variable (Osgood, 1957, p. 167).

Utility

To be utilitarian, an instrument must offer ease of administration under all conditions of measurement. The SD is capable of modification to allow rapid and accurate administration to all language users under almost any conditions as witnessed by studies involving children (Lilly, 1965) and cross-cultural investigations (Osgood, 1962).

Reliability

The reliability of the SD, the degree to which the same scores are reproduced when the same elements are measured repeatedly, has been examined in various ways. Osgood asserts that reliability coefficients for individual items cannot be computed and instead summation over items is done because "... the Semantic Differential scores are too consistent" (1957, p. 127) resulting in negligible variance so that computed reliability coefficients become meaningless. As a measure of score stability from test to retest, Osgood employed a score reproducibility criterion in order to compare deviations of a given size against the probability of obtaining deviations of that size. Using

his first factor analytic study with one hundred subjects and a forty item test as a source of data, Osgood found that the "... mean of the observed average deviations for items is .67 scale units, whereas the mean of the expected deviations is 1.20 scale units" (1957, pp. 129-130).

Norman (1959) conducted a test of reliability involving thirty subjects, twenty concepts, twenty scales, and a test-retest period of four weeks. His findings indicate that the mean score deviation was 1.07 units. No sex differences were apparent and forty percent of the scores remained the same while thirty-five percent shifted one unit. His analysis of group-mean ratings also reveal a high stability over time, during which no systematic treatment was administered.

In assessing the reliability of semantic judgements Osgood concludes that "... the average error of measurement with the Semantic Differential is no more than one scale unit while a change of greater than two units ... would occur less than five percent of the time by chance" (1957, p. 135). These statistics therefore serve as criteria in SD findings. Osgood (1957, p. 136) further points out that "... errors of measurement even on scales representing the same factor are essentially independent." This gives evidence of the reliability of the obtained factors.

Lilly (1965, p. 68) notes that for his study, the test-retest reliabilities "... were very high (at least .96) for all age groups." This is in agreement with other

findings (Miron, 1968).

Validity

Concurrent validation of the Semantic Differential technique is lacking since, as Osgood (1957) points out, there is no comparable criterion for measuring connotative meaning of concepts. Thus one must fall back upon construct validity, validity of semantic factors, validity of scaling assumptions, and validity as an index of the representational mediation process. A number of investigations have been conducted in psychological and educational circles which attest to the high construct validity for the scales (Osgood, 1952, 1957, 1959, 1962; Osgood, Ware, & Morris, 1961). Perhaps the most pertinent of these is Osgood's (1962) summary of cross-cultural SD research. These studies provide evidence for validity since they show that there are a small number of major dimensions in semantic space for all people. They also show that the similarities identified are more impressive than the differences. Kerlinger (1965, p. 680) contends that the predictive effectiveness of a theoretical construct evidences its "empirical reality" and hence its construct validity. The SD is an instrument of high predictive ability as seen in the studies noted above, thus it possesses acceptable constructive validity.

Validity of SD findings are further substantiated by Markel, Hunt, and Crapsi (1966, p. 350) who state that "... the Semantic Differential provides a method of assigning

differential meaning to various types of speech 'messages'" Barnard (1966, p. 469) concludes that the findings of his study are "... an indication of the validity of the Semantic Differential."

Rowan (in Osgood, 1957, p. 143) concludes from his study of the validity of semantic factors that the:

... representation of concepts by means of the Semantic Differential is a "natural" one, in the sense that the scales are representative of the semantic dimension people actually use in judging the meaning of concepts.

Osgood (1957) also bases the use of the Semantic Differential on certain scaling assumptions. First, the property of equal intervals within scales is assumed. Second, it is assumed that the zero point in each scale falls at the centroid of that scale. A procedure using a least squares solution developed by Diederich (in Osgood, 1957, p. 146), was employed to test these assumptions and it was revealed that an interval-like quality existed within scales and also that interval sizes were fairly consistent between scales. Also, the origin was discovered to fall in approximately the same place on all scales. As a result of these findings Osgood was led to conclude that "... the scaling properties assumed with the Semantic Differential have some basis other than mere assumption" (Osgood, 1957, p. 152).

A study by Messick (1957) reveals that the between scale intervals were quite similar and the distortion within the scales was not large enough to justify rejection

of the equal interval assumption. Mehling's (1959) study supports assumptions that the SD measures direction and intensity of attitude and the centre interval of the scale represents the neutral point.

The testing of the validity of the SD as an index of the representational mediation process is largely lacking to date. Osgood (1957, p. 154) cites the work of Jenkins and Russell at the University of Minnesota and Lambert at McGill University as being germane to this problem. These studies show that one can predict overt behaviors to signs from measurements and/or relationships indicated by the SD and factor analysis. This suggests that the SD is indeed a faithful index of meaning as a function of the representational mediation process. The reversibility of measurement operations gives perhaps the most direct indication of validity. It was found possible to discriminatively identify or label the concepts originally judged when the set of concepts involved is both small and highly varied in meaning (Osgood, 1957, pp. 165-166).

Comparability

Comparability is achieved to the extent that an instrument can be applied across a range of situations relevant to what is being measured and the results interpreted in a constant fashion. This criterion, too, is particularly pertinent to this study since an effort is being made to compare responses under two different

conditions thus bearing upon the Weltanschauung problem.

Studies of comparability across subjects indicate that for individual subjects (Osgood and Luria, 1954) and for groups of subjects, (Bopp in Osgood, 1957, p. 170) across language and culture variations, (Osgood, 1957, p. 172) the same general semantic characteristics are evident. Thus the SD can be expected to provide comparable measures under these conditions and to this degree.

Comparability across concepts poses a different situation. Most SD scales show significant variations in their correlations with other scales across concepts. Osgood (1957, pp. 176-180; 1962, pp. 22-28) noted that there is a high degree of concept-scale interaction and that the more evaluative a concept was the more the meanings of all scales shift toward evaluative connotation. He thus hypothesized that:

In the process of human judgement, all scales tend to shift in meaning toward parallelism with the dominant (characteristic) attribute of the concept being judged. (Osgood, 1957, p. 187).

It is the contention of the investigator that the same concepts will take on different dominant attributes in different contexts (language structures representing differential views of reality). Therefore there should be a concept-scale rotation for the same words depending upon the context within which the responses are made. This contention, if borne out, should serve to lend powerful support to the particular Weltanschauung view held in this study.

Osgood concludes that "... despite instability of individual scales, there is considerable repeatability (and hence comparability) of the major factors across the concepts being judged" (Osgood, 1957, p. 188). He adds, and as indicated above, this is one of the basic premises of the present study, that any rotation might well strengthen the validity of the instrument in measuring cognitive functioning.

IV. THE SAMPLE

In order to have a sample representative of the small town and rural school population of central Alberta within the grade level selected for the study, the total grade five population of one school jurisdiction was employed. The sample for this study consisted of all students registered in grade five in Leduc County, Alberta, Canada. This group comprised approximately three hundred seventy individuals in seventeen classrooms from nine elementary schools. Since special machine-scored answer sheets were employed, it was necessary to discard those sheets which were mutilated or improperly done. This reduced the sample to three hundred students, one hundred fifty for each form of the instrument.

Randomization procedures were employed to assign treatments and tests to students using the classroom as the randomizing unit. The treatment consisted of establishing the appropriate situational context in terms of the subject

area; i.e., a social studies context and a literature context. Consequently, nine classrooms were assigned the social studies treatment while eight classrooms were assigned the literature treatment. A control group consisting of six classrooms was also identified. Two classrooms from each of three geographic sections in the County were selected for this purpose. These six rooms were randomly assigned to two groups of sixty-six children for the purpose of testing. Children in these groups were administered both forms of the instrument at an interval of two weeks. The treatment for each of the two groups within the control group was randomly assigned. Children in three classrooms responded in the social studies context first and the literature context after two weeks while children in the remaining groups responded in reverse order. This was done to control for order effects of testing.

Randomization procedures employed in this study were assumed to be adequate control for the following variables:

- Intelligence Quotient
- Sex
- Place of Residence
- Socio-Economic Status
- Reading Ability
- Educational Background

Because the sample is the total population at this level in Leduc County, the results of the study can be generalized to any similar setting. Since a major determining factor in comparability of student populations is

socio-economic status of parents, this feature of the experimental sample will be described in Table III in terms of parental occupation. Occupations listed and the numbers employed in each category were derived from official school registration forms.

V. THE PROCEDURE

One treatment and one form of the Semantic Differential were administered to each of the seventeen classroom groups according to a randomly assigned order. The experimental procedures adhered to the following general format.

1. All students were required to rate the ten concepts (Table II) on the twenty scales (Table I) of the Semantic Differential designed for this study. (See Appendix B for samples of the two forms of the instrument.)

2. The experimental treatment, consisting of establishing the necessary situational context, was administered by the regular teacher of the subject area serving as the context.

3. The Ss comprising the control group received both forms of treatment; i.e., were administered the test instrument under both conditions of context. The situational contexts, social studies and literature, were produced in random order for each of the six classrooms within the control group.

4. The procedures followed in administration of both forms of the instrument during both occasions of

TABLE III

EXPERIMENTAL SAMPLE - PARENTAL OCCUPATIONS

Occupation	Percent
Airport Employee	1.2
Barber .....	.3
Building Contractor	1.5
Bus Driver .....	.9
Carpenter	5.2
Civil Servant .....	.6
Clerk (store)	1.5
Construction	1.7
Cook .....	.3
Dairy Industry (manufacturing) ..	.6
Dentist .....	.3
Electrician	1.5
Engineer	2.3
Farmer	48.0
Garage Operator	1.5
Government Official .....	.3
Horse Racing Official .....	.3
Janitor .....	.3
Laborer	5.2
Lawyer .....	.3
Mechanic	2.6
Merchant	1.5
Minister .....	.9
Oil Worker	10.0
Plumber .....	.6
Postmaster .....	.6
Ranch Foreman .....	.6
Road Maintenance .....	.9
Salesman .....	.3
Serviceman .....	.9
Stenographer .....	.3
Teacher	2.3
Truck Driver	4.5
Veterinarian .....	.3
Welfare .....	.6

administration were on the basis of a rigid protocol having this general format:

- a) Upon receipt of materials teachers familiarized themselves with purposes of the investigation and procedures of administration.
- b) The day after receipt of test materials and near the conclusion of a regular social studies or literature period (depending upon the situational context to be established) the regular teacher informed the class of the test to be administered the following day. The teacher was instructed to emphasize that the test was one of word meaning in the appropriate subject area and that no preparation other than experience was possible. Also, procedures for responding to test items were previewed. This routine, it was hypothesized, would be sufficient to establish situational context for Ss forcing them to respond differentially to the same concepts (see Appendixes C and D).
- c) Testing was conducted during the regularly scheduled social studies or literature period in each classroom in order that situational context (treatment) be maintained.
- d) Students were warned to work quickly, putting down their first impressions on each scale.

- e) Following a two week interval, the control groups were administered the alternate form of this instrument, following the above procedure.
- f) Students immediately transferred all responses to answer sheets. These responses were subsequently transferred to IBM punch cards for computer analysis at the University of Alberta Data Processing Centre.

VI. TREATMENT OF THE DATA

Subject reliability coefficients were obtained for students in the control group. The reliability of responses of individual subjects was obtained by computing the correlations between the twenty scale ratings on each of the two forms of the test. These provided statistical evidence of the effect of treatment upon responses in a test-retest situation. Responses on the twenty scales for each of the ten concepts in both forms of the test instrument were intercorrelated so that correlation matrixes were available for each of the two groups of students. Summation was done over concepts and subjects.

Factor analysis was obtained by the principal axes method by computing the eigenvalues and eigenvectors for each matrix. The size and number of latent roots with values greater than unity was observed to determine the most significant factors of meaning for each group. To

obtain simple structure (Thurstone, 1947) the factors for each form of the test were rotated according to the Varimax Criterion (Kaiser, 1958). The rotated axes thus obtained constituted the data for the factorial structures which were interpreted and compared.

Factor analysis produces fewer factor structures than the number of measures. Thus analysis was based upon those scales which loaded most highly in a particular dimensional factor.

Graphic plots were made of all factors in each context. These plots give some indication of the relationship of the scales with the respective factors. They also present a spatial-visual representation of the orthogonal nature of SD factors.

Results of data analysis were compared both qualitatively and quantitatively for each group with differences interpreted as indicative of different structures of reality as expressed in language.

CHAPTER IV

ANALYSIS OF RESULTS

The generality of the structure of meaning as measured by the SD has been well documented by a number of studies using widely differing concepts and S populations (Osgood, 1957; Osgood, 1962; Di Vesta, 1966; Maltz, 1963; Lilly 1965). In a similar vein, the influences of certain environmental factors upon meaning have been examined (Barnard, 1966; Koen, 1962; Miller, 1966; Harbin & Wright, 1967). The present study is viewed as adding to this documentation as well as opening up another aspect of meaning for measurement.

The Semantic Differential is saturated with more than one factor. Therefore all factors obtained for each context were examined for dimensionality and the magnitude of their saturations was considered. These data became the bases of the quantitative and qualitative analysis conducted in this study.

I. CONTROL GROUP FINDINGS

Subject Reliability Coefficients

A group of sixty-six students, comprising approximately one-half of the control group for this study, produced the data herein analyzed. The total control group was divided into two to permit alternate administration of the two forms of the instrument and thus control for order

effects. Examination of the data revealed that the factor loadings in the second testing tended to be somewhat higher but that social studies factors were generally wider for both control groups. Since no major shifts in factor structure appeared between the two control groups, only the results for one will be analyzed in the interests of brevity.

The reliability of responses of individual subjects was obtained by computing the correlations between the twenty scale ratings for each concept on one form of the instrument with those on the second form. In both cases the concepts and scales were identical, the difference being in the situational context within which the responses were set. It was hypothesized that the effect of experimental treatment; i.e., the creating of different contexts within which responses to the tests would be made, would cause individuals to respond differently to the same concepts. This would result in a lower correlation between the two responses than in the case of a test-retest using the same context. Thus a low r would be indicative of the influence of a systematic variable upon responses. Context, the systematic variable in this study, could therefore be shown to affect the responses of students. Table IV shows correlations for each scale as well as the mean r . Table V illustrates comparable reliability indices discovered by Lilly (1965, p. 30).

Table V, A gives intra-subject reliabilities for two

TABLE IV
SUBJECT RELIABILITY
COEFFICIENT CORRELATIONS ON SCALES

Scale	r
1. clean - dirty .....	.597
2. painful - pleasurable .....	.531
3. soft - hard .....	.418
4. light - heavy .....	.390
5. rough - smooth .....	.355
6. moving - still .....	.401
7. strong - weak .....	.464
8. fast - slow .....	.342
9. important - not important ...	.507
10. kind - cruel .....	.583
11. excitable - calm .....	.329
12. large - small .....	.405
13. dangerous - safe .....	.570
14. bad - good .....	.604
15. steady - changing .....	.272
16. unusual - usual .....	.351
17. ugly - beautiful .....	.528
18. hot - cold .....	.253
19. complex - simple .....	.396
20. uncertain - certain .....	.324

mean r = .431

TABLE V

RELIABILITY INDICES
A. MEAN OF N SUBJECT RELIABILITIES

Concept	My Mother	Elephant
Grade Six	.80	.70

B. RELIABILITIES OF GROUP MEAN RATINGS

Concept	My Mother	Elephant
Grade Six	.99	.99

concepts as rated by grade six students indicating very high test-retest reliabilities among groups of individuals on individual concepts. Osgood (1957, p. 127) reports a test-retest correlation of .85. No other intra-subject reliabilities have been reported in previous SD ratings (Lilly, 1965, p. 31). Table V, B gives reliabilities of group mean ratings; i.e., the mean rating on each adjective scale for the first occurrence of the concept is correlated with the mean rating of the concept received on its second occurrence. It can be seen from Table V that these coefficients are very high. In the absence of experimental treatment it appears that group mean ratings remain stable over time.

Similar high correlations between mean rating have been found by other experimenters in studies with college students. Norman (1959) found that the reliability of group mean ratings was .96. Jenkins, Russell, and Suci (1958) found a correlation between mean ratings of .97.

The correlations listed in Table IV, being mean responses over concepts of the same individuals in two different situations, are therefore directly comparable to these findings. In Lilly's words, "In the absence of experimental treatments ... ratings ... remain quite stable over time" (Lilly, 1965, p. 31). The present study involved the application of treatment in the form of establishing a different context at each testing. The experimenter therefore concludes that the effect of this

treatment has been to decrease the coefficient of correlation between responses. This result is taken to provide statistical evidence for the effects of context upon word meaning and grant veridicality to the differential factor structure which emerged in the two contexts.

Scale Factors - Factor Match

The Ahmavaara Factor Match was employed to determine the degree of congruence between factors within the two contexts. Table VI gives the comparison matrix which shows the cosines of the angles between the axes of the orthogonal dimensions of meaning identified by the Semantic Differential. The values in the principal diagonal adduce proof that the dimensions identified measure substantially the same kind of semantic component in each case. While the cosines, ranging from .8217 to .9794, indicate that the axes of the dimensions are near collinearity, the decreasing degree of congruence attests to the presence of differences in factor structure. Also, since the factor match is analogous to comparing averages, as in averages the elements may vary quantitatively. This appears to be true in the case of SD factors. The factors obtained are generally congruent in that they measure essentially the same kind of psychological process but quantitative and qualitative variations in the elements of these factors suggest somewhat different underlying behaviors. One such difference among the present factors is the inverse relationship of factor three in the two contexts.

TABLE VI
COMPARISON MATRIX L - CONTROL GROUP
LITERATURE

Factors		1	2	3	4	5
S O C I A L S T U D I E S	1	.9794	-.0675	.0208	.1628	.0962
	2	-.0087	.9119	-.0595	.2857	.2883
	3	-.1104	-.0791	-.9553	.0455	.2584
	4	.0561	-.4379	-.0158	.8459	-.2987
	5	-.1344	-.3001	.3549	.3011	.8217

Research employing the SD provides no data on the application of the Ahmavaara Factor Match to comparison of factors but other similar indices of factorial similarity are employed such as the coefficient of congruence (Osgood, 1957, 1961; Eastman, 1963; Lilly, 1965).

In a cross-cultural study of the generality of semantic factors by Kumata and Schramm (Osgood, 1957, pp. 171-174) indices of factorial similarity of 1.00 were reported on a test-retest situation with an interval of three weeks. This was the value for individuals responding in their native language. When semantic structures of different language groups were compared the indices were lower (going down to .87). Osgood concluded that the language used by bilinguals in reacting to the SD has little effect upon the semantic frame of reference.

On the other hand Lilly, in his developmental study, reports the lowest congruence coefficients as ranging from .87 to .53, for the evaluative and stability factors respectively, between the grade three and grade nine groups (Lilly, 1965, pp. 70-71). In the same vein Eastman reports congruence coefficient values ranging from .81 to .86 between grade nine and university students (Eastman, 1965, p. 89). In the Eastman study only a single concept "school" was indexed permitting greater agreement than in a multi-concept study such as that by Lilly and the present study. Both Lilly and Eastman concluded that, while there was a basic similarity in meaning for the various groups

examined, there were also measurable differences (Lilly, 1965, pp. 71-72; Eastman, 1963, p. 94).

The evidence on factorial similarity in the present study is considered indicative of a change in factorial structure between contexts. This assertion is made in the light of Osgood's report of the stability of semantic structures and evidence provided by Lilly and Eastman relative to the change in factor structure due to developmental influences. Since factor structure remains very stable for the same individuals but can be altered by such influences as maturation and learning, the differences in semantic structure indicated in Table VI are considered to be due to the independent variable in this study -- context.

This evidence as well as the subject reliability coefficients indicate that the same individuals do structure meaning differently in different contexts. Thus data from the main experimental group will be considered valid and differences between subgroups to be real rather than due to sampling error. Further analysis will be carried out with the assumption that other tests of significance are unnecessary. The following section is, therefore, a detailed analysis of scale factors for the total group.

II. EXTRACTION OF SCALE FACTORS

SUMMING OVER CONCEPTS

The statistical analyses of the Ss' ratings of the ten concepts were examined for each group. Initial examination of scores on each scale revealed that the means of scores were not at the centre of the scales, the neutral point. This finding is indicative of the validity of these scales for indexing of the concepts. The Ss were able to make meaningful judgements of the concepts on each of the SD scales.

The ratings obtained on each form of the SD were inter-correlated and factor analysis accomplished by computing the eigenvalues and eigenvectors for each matrix of correlations. Each principal axis (factor) which had an eigenvalue greater than unity was retained for analysis. Eigenvalues of less than unity value account for less of the total variance than any single variable.

In the social studies data there were five general scale factors with eigenvalues ranging in value from 4.811 to 1.028 and accounting for 53.402 percent of total variance. In the literature context there were also five factors ranging in value from 4.782 to 1.073 and accounting for 52.383 percent of the total variance. These factors and their values are given in Table VII.

The meanings of the selected concepts are defined by the relationships expressed by the correlations between scales and the variance accounted for by each dimension

or factor indicates the degree to which that factor indexes meaning in each context. Thus for the two groups the five factors measure over fifty percent of the total variance. This is an acceptable level of effectiveness of analysis according to Osgood who contends that the total variance accounted for must be interpreted in relation to error variance. He considers that with an average reliability for the SD of .80 the "... maximum possible reliable variance that could be extracted in an analysis would be 64 percent (.80 squared) of the total" (Osgood, 1958, p. 198). The proportion of the total variance also depends upon intercorrelations among measures; thus, if the scales are independent, the proportion of total variance extracted is reduced. Examination of results shows this independence of measures to be true in the present study where the total variance accounted for is about fifty percent with no one scale or factor accounting for most of the variance. Since each of the five obtained factors contributes substantially to the total variance extracted all will be considered in the analysis.

III. THE VARIMAX ROTATION

The five factors extracted were rotated to simple structure (Kaiser, 1958, pp. 187-200). The variances of the factors after rotation (sums of squares of loadings of scales which define the factors) are presented in Table VIII. Loadings on scales for the rotated principal

TABLE VII
FACTORS WITH EIGENVALUES GREATER THAN UNITY

Factor	Social Studies	Literature
1	4.811	4.782
2	2.189	2.037
3	1.515	1.469
4	1.137	1.116
5	1.028	1.073
Percent of Total Variance		
	53.402	52.383

TABLE VIII
VARIANCE ACCOUNTED FOR BY EACH ROTATED FACTOR

Factor	Sums of Squares of Loadings	
	Social Studies	Literature
1	4.118	3.426
2	1.653	1.548
3	1.505	1.484
4	.993	1.355
5	.959	.918
Percent of Total Variance		
	53.401	52.382

axes factors are given in Tables IX, XI, XII, XIII, and XIV. These data form the bases of the quantitative and qualitative analysis to follow.

IV. SCALE FACTORS

The most apparent general observation from these data is the changing pattern of factor loadings and number of high loading scales from context to context denoting a change in the quality of meaning measured by these dimensions. A further general observation is the change in the order of the Potency and Activity dimensions from their usual positions.

Another observation is the nature of differences within the dimensions, subtle in the first three factors and more marked in the last two. This change within dimensions is consistent, establishing an overall pattern of shift in dimensionality between contexts.

Many scales are common to both sets of factors in the principal dimensions (the first three -- similar to those identified in most other SD studies). These scales are also frequently in the same rank order. The secondary dimensions, on the other hand, differ markedly between contexts.

A number of "unique" scales is found in each dimension. Scales are considered "unique" when they load heavily in a dimension in one context and have negligible loadings in the congruent factor in the other context.

Finally, since all factors contribute substantially to the amount of variance accounted for, they are all considered important in mapping out the semantic space of the concepts measured in the two contexts.

It will be noted that differences in factor structure for scales summed over concepts and subjects are relatively minor. This is in contrast to the much more conspicuous differences evident when individual concepts are analyzed. The first result can be explained by the fact that differential meaning structures of individual concepts tend to compensate for each other making for a smaller general difference. This effect is analogous to taking an average of a set of measures, the result is the midpoint of all component values. Therefore it is expected that in general affective meaning structures will be similar but with particular concepts meaning will vary markedly generating a different perception of that concept in that particular context. This regression to the mean is discussed further in subsequent portions of the analysis.

(a) Principal Dimensions

Dimension I

In the social studies context Dimension I with a sum of squares of 4.118 accounts for 21.784 percent of total variance in meaning of concepts. The scales characterizing this factor are: kind (+), good (+), pleasurable (+), beautiful (+), safe (+), clean (+), important (+), smooth (-), and soft (-). (Signs of scales are indicated in parentheses).

Dimension I in literature has a sum of squares of 3.426 and accounts for 19.845 percent of the total variance. Scales characterizing this factor are: good (+), kind (+), pleasurable (+), beautiful (+), safe (+), important (+), clean (+). The scales were selected on the basis of factor loadings; all scales having a loading value on Dimension I which was greater than .400 were included in the factor. These scales and their rotated loadings are presented in Table IX. This table also gives the scale communalities which represent the amount of variance of the scales which can be accounted for by the factors identified. See Appendix F for loadings of all scales on all factors).

From Appendix F it can be seen that factors are not pure but are characterized by scales saturated on several factors. Although there are no pure scales (and consequently factors) the pattern of loadings of scales on factors gives factors their distinctive characteristics. To the extent that scales in Table IX characterize Factor I rather than any other factor, they are considered to be valid indicators of the quality of Factor I.

This dimension is very clearly Osgood's Evaluative (E) dimension and accounts for the greatest amount of variance in both test situations. There are both factor loading differences and scale differences between factors in each context in the first dimension (see Figure 13) and these, it is hypothesized, indicate the rather subtle differences in meaning between context situations.

TABLE IX
PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. I

SOCIAL STUDIES - EVALUATION					LITERATURE - EVALUATION				
Adjective Scale	Po*	F*	Load- ing	h^2	Adjective Scale	Po	F	Load- ing	h^2
kind cruel	+	E*	814#	684#	good bad	+	E	793	677
good bad	+	E	812	694	kind cruel	+	E	761	660
pleasurable painful	+	E	780	631	pleasurable painful	+	E	754	612
beautiful ugly	+	E	751	567	beautiful ugly	+	E	709	534
safe dangerous	+	N*	692	576	safe dangerous	+	N	696	568
clean dirty	+	E	666	565	important not important	+	E	591	465
important not important	+	E	514	450	clean dirty	+	E	556	555
smooth rough	-	P*	494	540					
soft hard	-	P	439	521					
TOTAL VARIANCE			21.784		TOTAL VARIANCE			19.845	

*Po - Polarity
F - Factor Loading
E - Evaluation
N - Novelty
P - Potency
Decimal Point Omitted

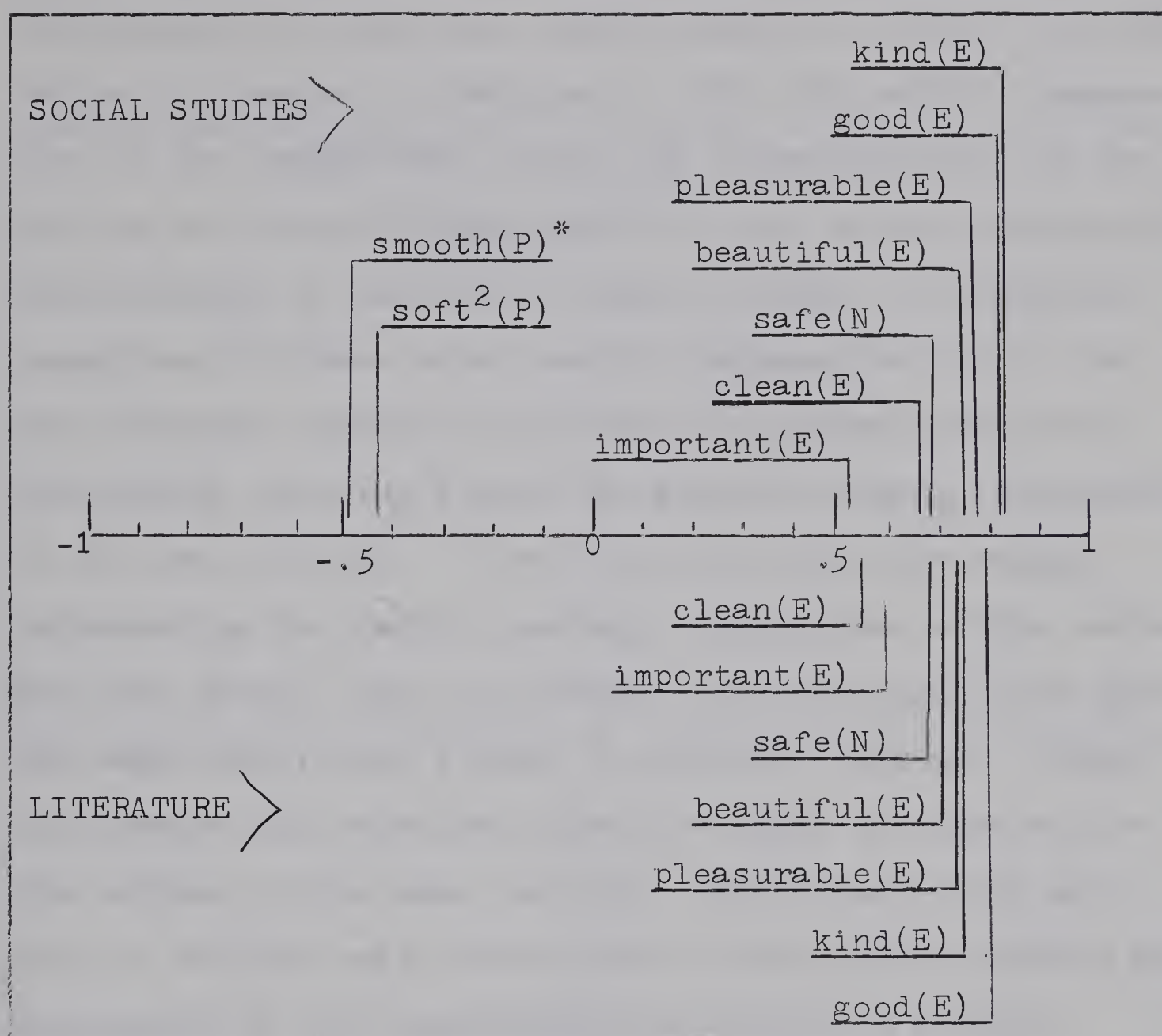


FIGURE 13

FACTOR LOADINGS¹
 DIMENSION I
 SOCIAL STUDIES - EVALUATION
 LITERATURE - EVALUATION

*E - Evaluation
 A - Activity
 P - Potency
 N - Novelty

- ¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity in diagramming

The graphic plots in Figures 14 to 21 illustrate the relationship to each high loading scale to Factor I as this factor is compared to Factors II, III, IV, and V. Inspection of the graphs will reveal the characteristics of the factors as defined by the scales as well as the orthogonal relationships of factors in semantic space. Furthermore, comparison of these relationships between factors in the two different contexts illustrates diagrammatically the differences existing within the general meaning structures in the two contexts. It will be noted that the points representing the factor loadings (correlation of the scale with the factor) fall in somewhat different positions when the same factors are viewed in different contexts. These differences are relatively small as might be expected for the ratings of the same concepts; nonetheless, they are held to reflect real differences in connotative meaning as determined by the representational mediation process.

Loadings are consistently higher in the Social Studies (E) dimension. This may be interpreted as indicating a greater meaningfulness for scales in this context. This in turn suggests a greater intensity or polarization in responses on scales. Within the theoretical framework of the representational mediation process this effect is an indicator of degree of meaning (Di Vesta, 1966, p. 222). Thus concepts such as those employed as stimulus words in this study appear to be more meaningful in a social studies context. This conclusion is offered support by the fact

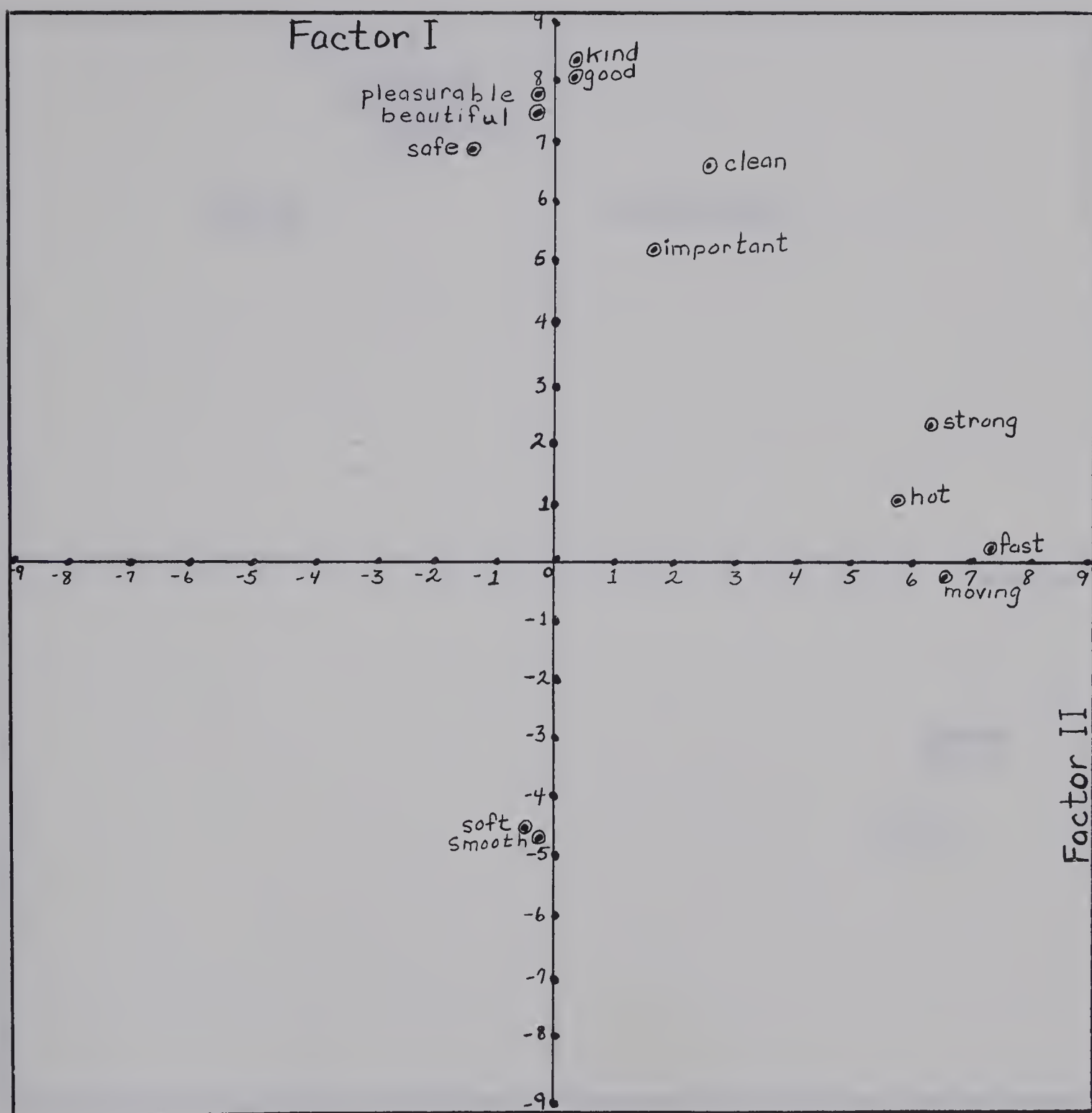


FIGURE 14

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & II
SOCIAL STUDIES

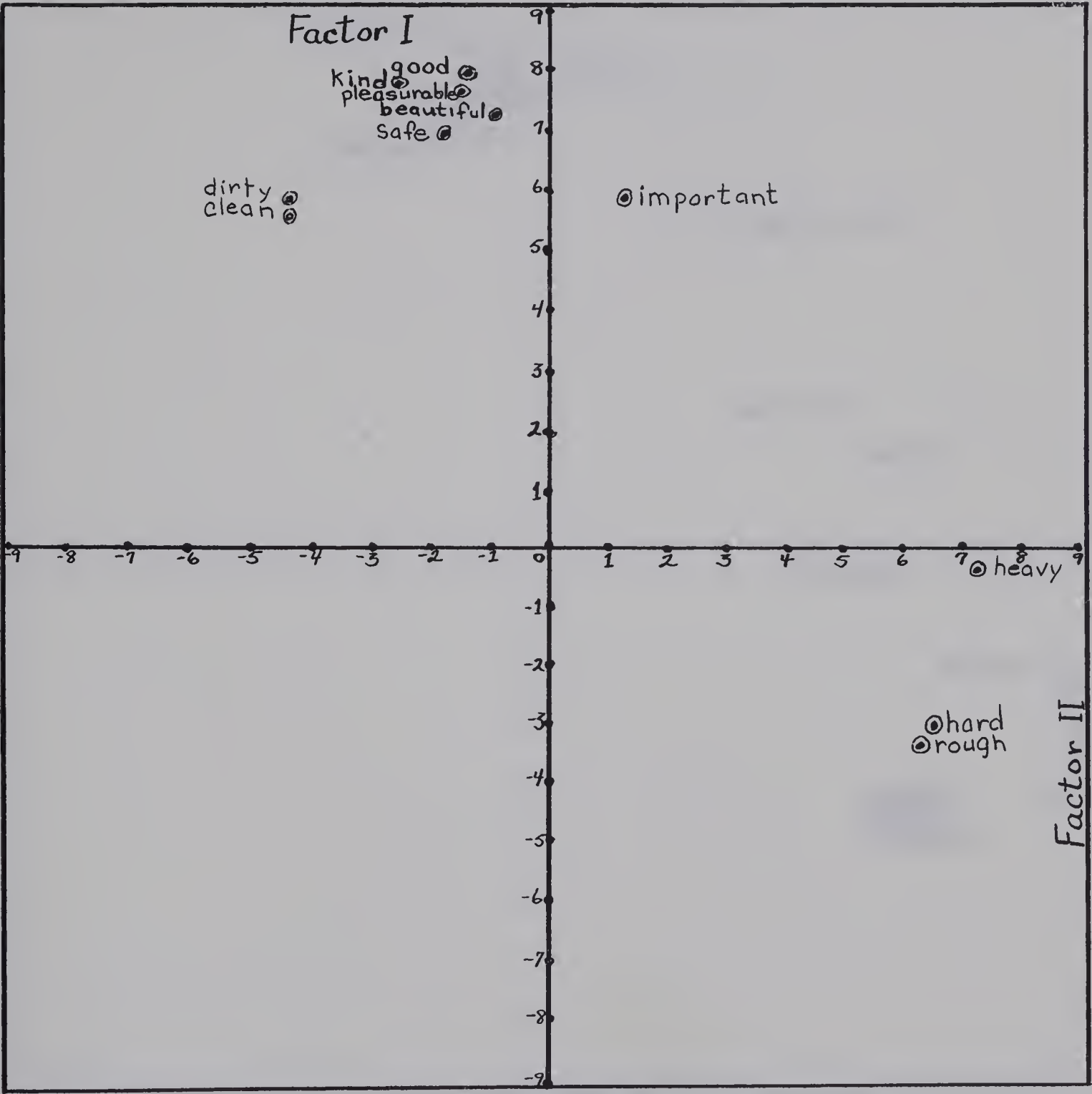


FIGURE 15

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & II
LITERATURE

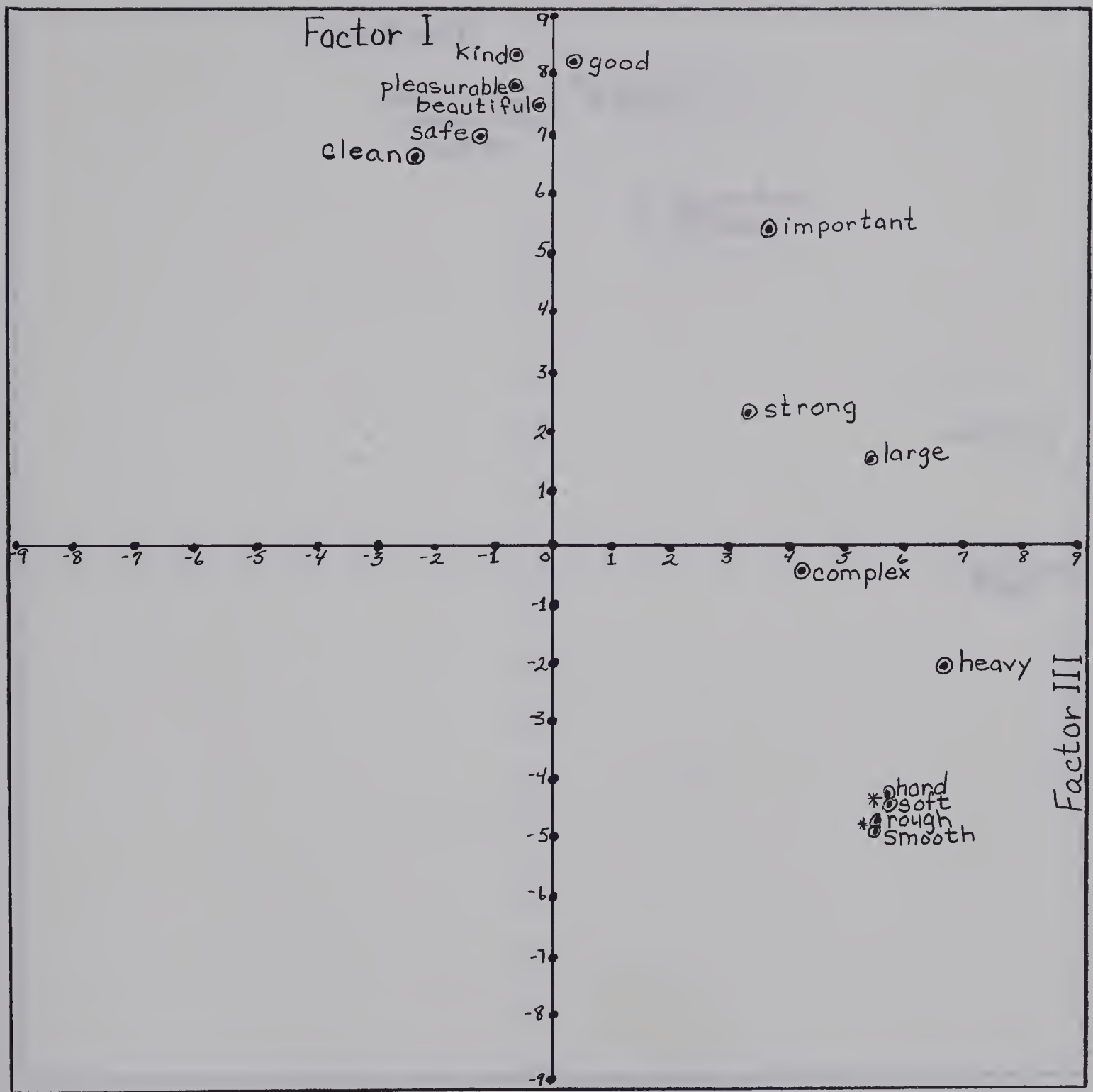


FIGURE 16

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & II
SOCIAL STUDIES

*Same scales appear with changed signs

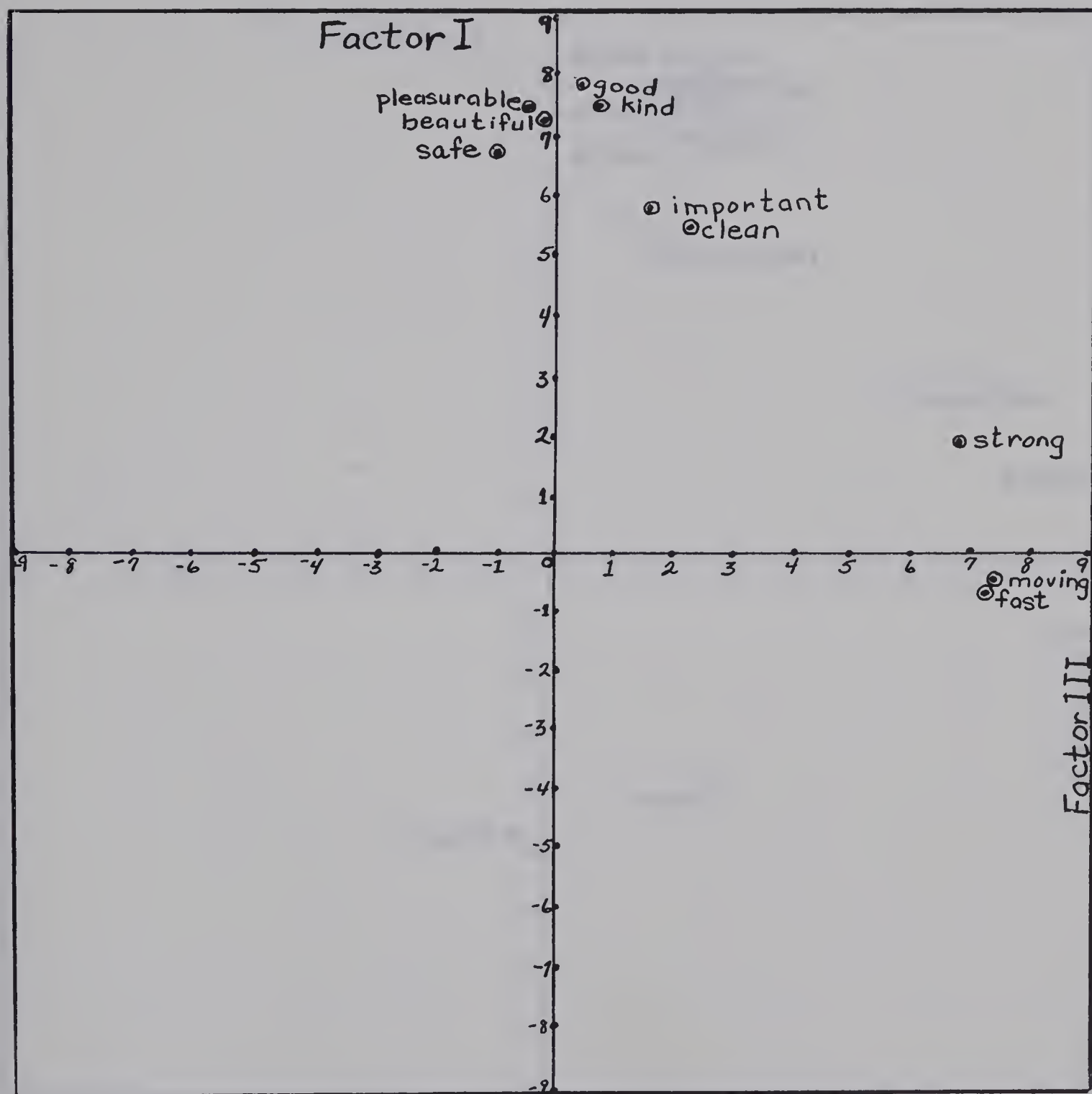


FIGURE 17

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & III
LITERATURE

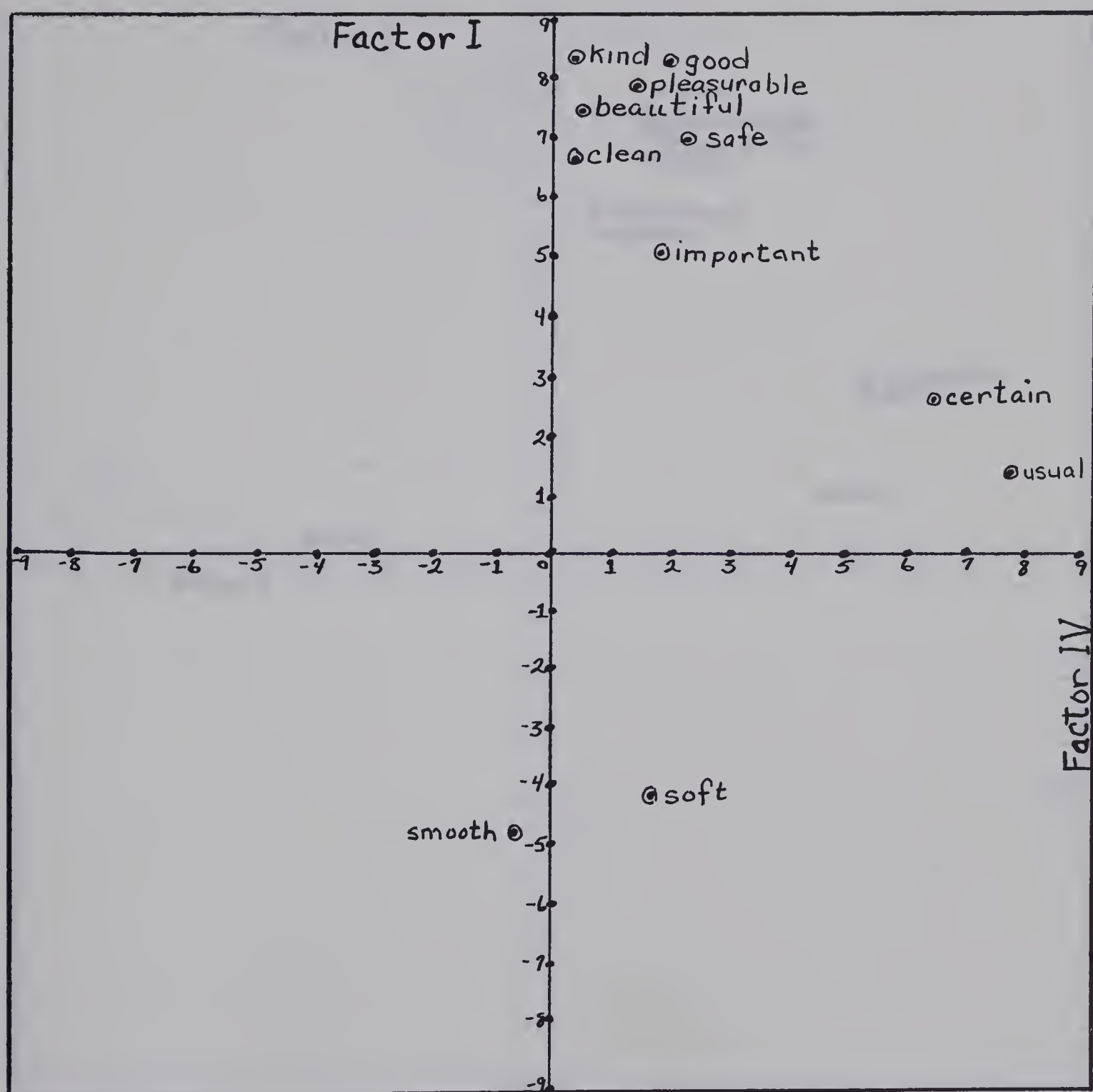


FIGURE 18

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & IV
SOCIAL STUDIES

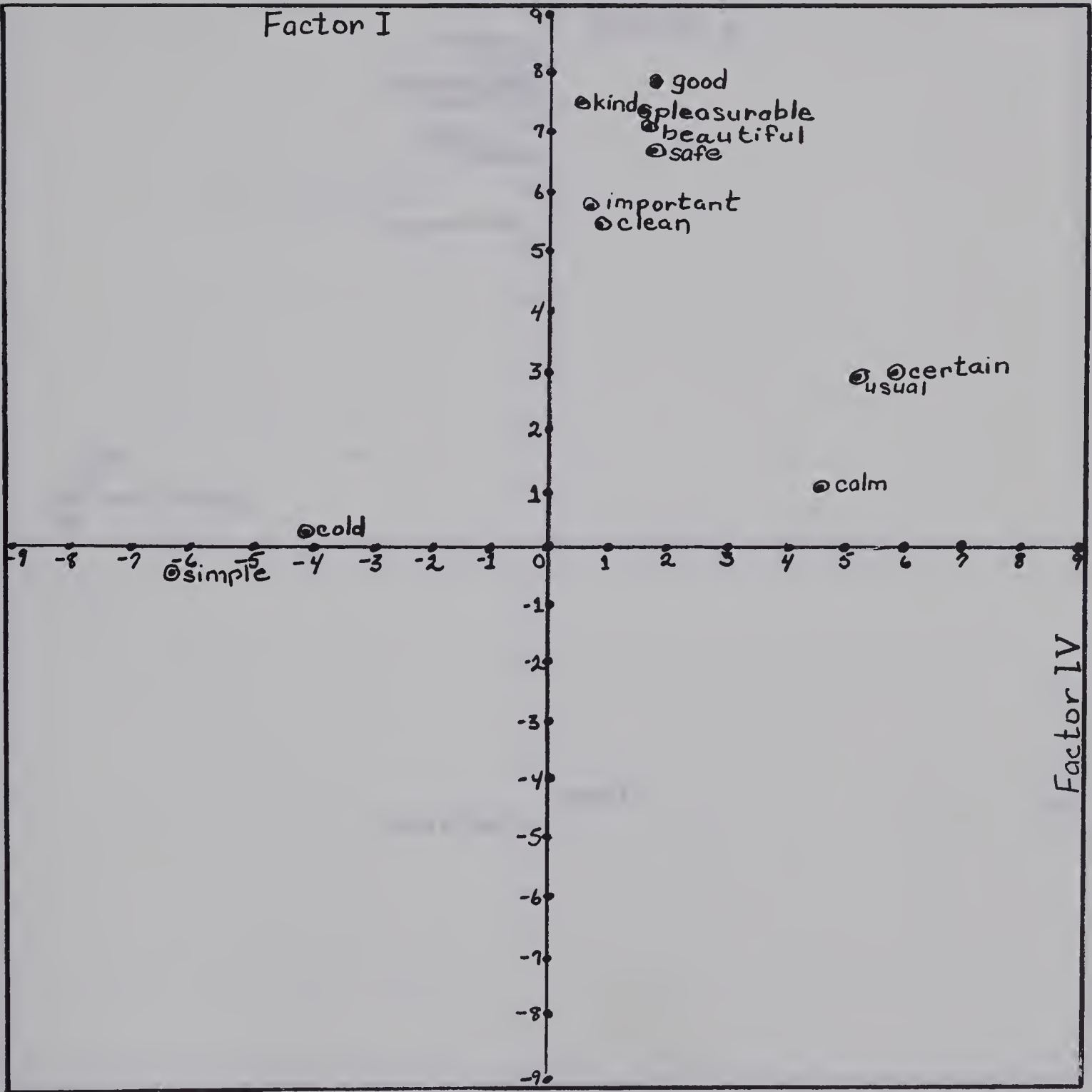


FIGURE 19

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & IV
LITERATURE

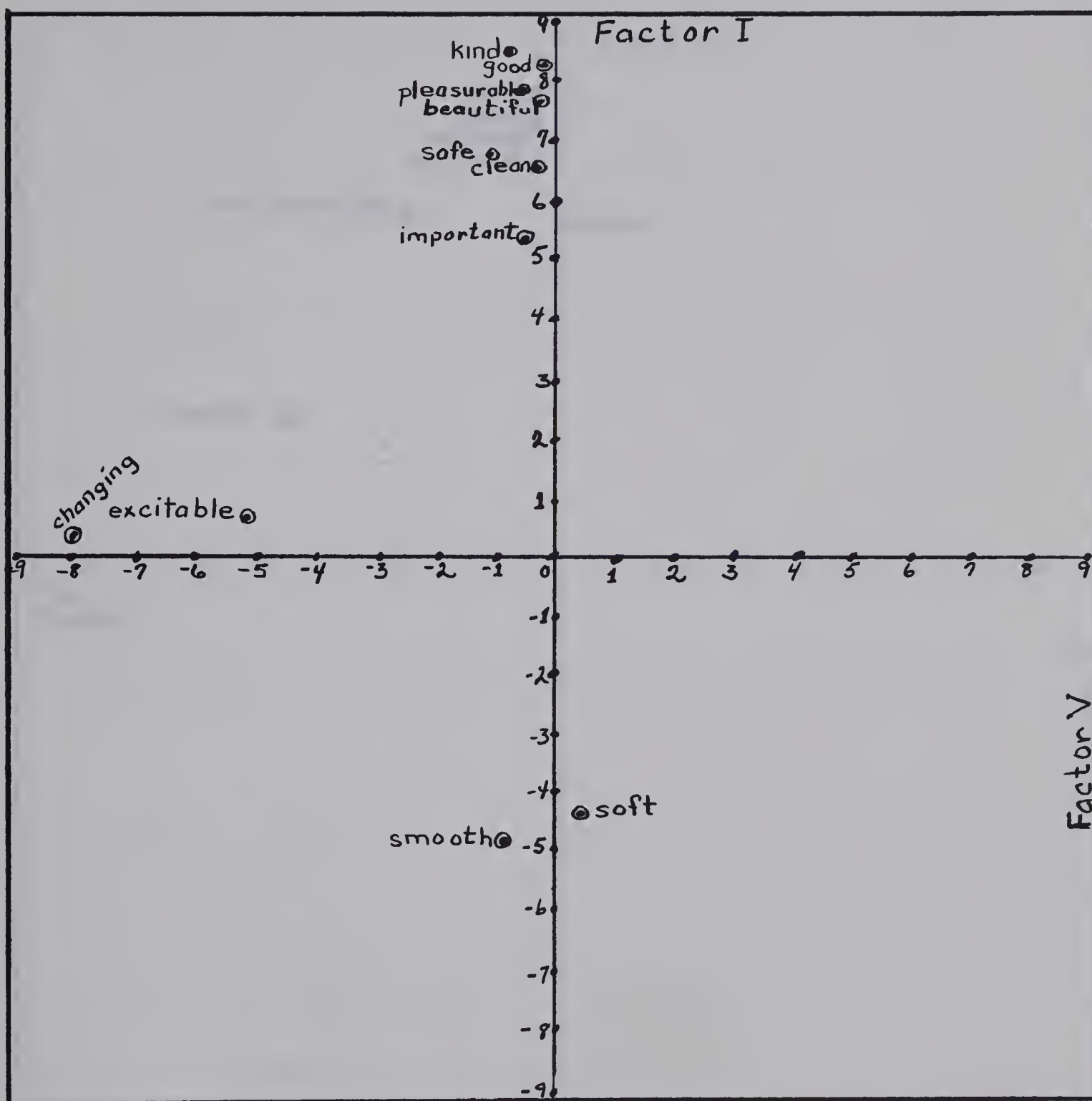


FIGURE 20

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & V
SOCIAL STUDIES

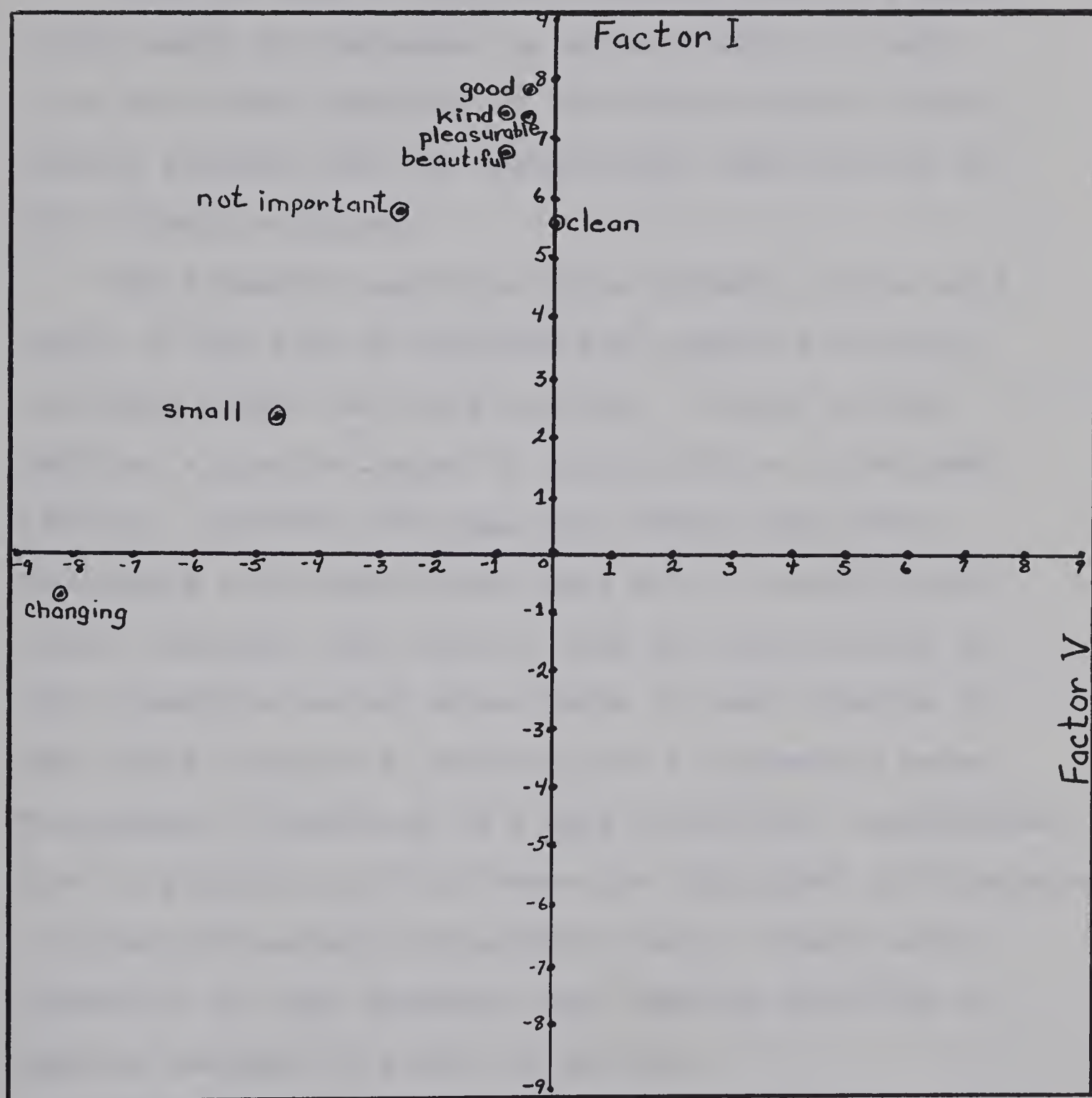


FIGURE 21

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS I & V
LITERATURE

that the (E) dimension accounts for more of the total variance in social studies than it does in literature.

Further support for this interpretation is evident in the means for responses on scales, Table X. Here it is seen that responses in the social studies context deviate further from the neutral point than they do in the literature context.

The situation described above probably arises as a result of the kind of learning and cognitive activity occurring within the two situations. Social studies requires a greater degree of objectivity of conceptualization. Concepts and ideas are learned from their contiguity with significates that are in general more fixed, concrete, and specific than are significates in the literature context where there is less occasion to meet these concepts in anything but a figurative sense. Furthermore, literature is a more subjective, intellectual kind of academic activity where the individual is encouraged to interpret concepts idiosyncratically. There would, therefore, be less agreement upon meaning resulting in smaller loadings of scales on factors.

The scales common to both (E) dimensions do not all show the same rank order suggesting that certain features of this dimension are more important in certain contexts. Also, there are certain unique scales in the social studies (E) factor giving a different complexion to this dimension as compared with the congruent scale factor in literature.

The (E) dimension in social studies contains two unique scales: smooth - rough and soft - hard. These have been found to load heavily on the potency dimension in other studies with children (Lilly, 1965, pp. 17, 49). The presence of these scales adds further support to the contention that concepts in a social studies context are considered in more concrete and objective terms than in a literature context. Concepts representing reality from a social studies perspective appear to take on a more objective character possibly due to the more readily observed nature of this reality than is the case in literature. Potency attributes thus are more readily ascribed to observable phenomenon than to a figurative or phenomenalistic one. That this aspect of meaning is present in the factor accounting for the greatest variance attests to its importance.

A more puzzling outcome of the indexing of concepts is the polarity of responses. The scale means (Table X) indicate that responses on each scale comprising the (E) dimension were nearer the negative end of the scale. This places an unfavorable complexion upon evaluative judgements of concepts in both contexts. It is an unexpected result in that adults, taking the naive commonsense point of view, believe children to evaluate most of what they meet in a generally favorable light. This is not borne out in these responses suggesting that the systematic variable present in the total context, the school setting and in particular

TABLE X
SCALE MEANS*

Scale	Social Studies	Literature
1. clean - dirty	2.389	2.479
2. painful - pleasurable	2.488	2.655
3. soft - hard	2.705	2.801
4. light - heavy	2.914	2.801
5. smooth - rough	2.877	2.924
6. still - moving	2.369	2.693
7. weak - strong	1.825	1.955
8. slow - fast	2.301	2.389
9. not important - important	1.290	1.463
10. cruel - kind	2.527	2.647
11. calm - excitable	3.093	3.034
12. small - large	2.205	2.333
13. dangerous - safe	2.764	2.788
14. bad - good	2.202	2.325
15. steady - changing	3.218	3.341
16. unusual - usual	2.114	2.356
17. ugly - beautiful	2.702	2.693
18. cold - hot	2.673	2.864
19. simple - complex	2.712	2.941
20. uncertain - certain	<u>2.272</u>	<u>2.332</u>
Grand Mean	2.4820	2.5907

* 3.00 = Neutral "0" response

the test situation, may have generated this unfavorable attitude.

Dimension II

Dimension II provides an interesting change between contexts. On the basis of the amount of variance accounted for, the second factor in social studies is not congruent with the second factor in the literature context. In the social studies context Dimension II with a sum of squares of 1.653 accounts for 9.885 percent of the total variance of meaning. The scales characterizing this dimension are: fast (+), moving (+), strong (+), and hot (+). Dimension II in literature has a sum of squares of 1.548 and accounts for 9.740 percent of the total variance. Scales identifying this factor are: heavy (+), hard (+), rough (+), and dirty (-). As in Dimension I, only scales loading more than .400 were selected as contributing meaningfully to the dimensionality of the factor. These scales and their rotated loadings are presented in Table XI. Figure 22 illustrates their relationship diagrammatically.

Dimension II in social studies has been designated the Oriented Activity (OA) factor because the scales defining this dimension have been found to load on potency as well as activity, justifying the "oriented" characterization. The high loading on strong - weak, a scale commonly characterizing the potency factor, appears to add further to the emphasis on a strong potency element to word meanings in the social studies context which became evident in the

TABLE XI

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. II

SOCIAL STUDIES ORIENTED ACTIVITY					LITERATURE POTENCY				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
fast slow	+	A*	716 [#]	545 [#]	heavy light	+	P	715	527
moving still	+	A	661	497	hard soft	+	P	631	512
strong weak	+	P*	612	537	rough smooth	+	P	617	505
hot cold	+	A	573	419	dirty clean	-	E*	440	555
TOTAL VARIANCE 9.885					TOTAL VARIANCE 9.740				

*Po - Polarity
F - Factor Loading
A - Activity
P - Potency
E - Evaluation
Decimal Point Omitted

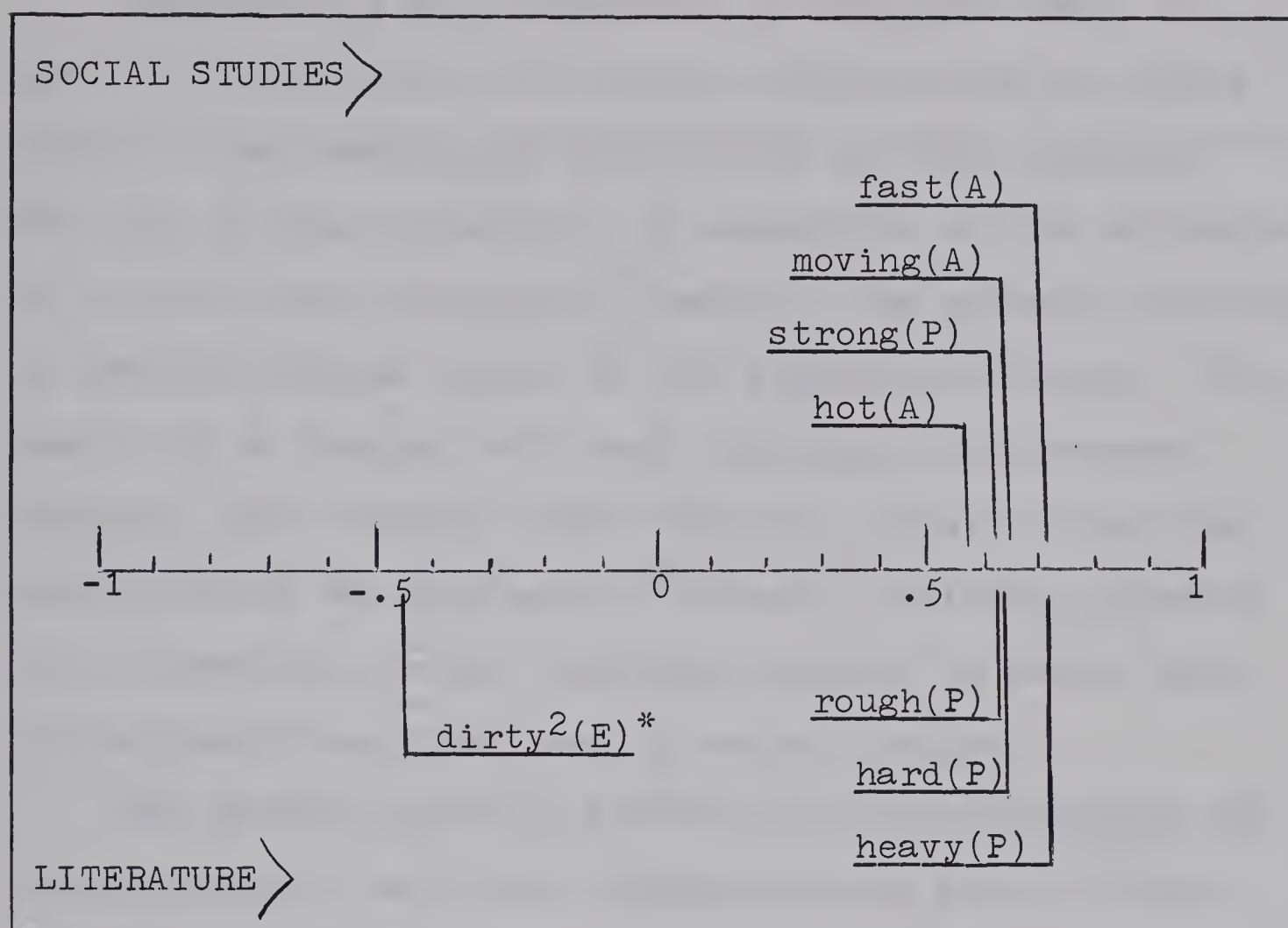


FIGURE 22

FACTOR LOADINGS¹

DIMENSION II

SOCIAL STUDIES - ORIENTED ACTIVITY

LITERATURE - POTENCY

- *
 E - Evaluation
 A - Activity
 P - Potency

- ¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity of diagramming

(E) dimension.

Dimension II in literature, on the other hand, is seen to be a Potency (P) factor, characterized by scales found to load heavily on this factor in other studies. The fact of this occurrence is suggestive of the influence of context upon connotative meaning. The potency component of meaning emerges second in the literature context. This result is in keeping with most findings in SD research (Osgood, 1957; Osgood, 1962) where the order of the first three factors was Evaluation, Potency, Activity. Meaning in a literature context therefore appears to have a more conventional form than that in social studies.

The graphic plots in Figures 23 to 28 illustrate the relationship of each scale characterizing Factor II as this factor is compared to Factors III, IV, and V. Relationships and differences similar to those found in the plots for Factor I are evident here.

Dimension III

This dimension also exhibits a lack of congruence between factors in the two contexts. In the social studies context Dimension III with a sum of squares of 1.505 accounts for 9.145 percent of the total variance. The scales with loadings of .400 and above on this factor are: heavy (+), hard (+), large (+), rough (+), and complex (+). Dimension III in literature obtained a sum of squares of 1.484 and accounts for 9.318 percent of the total variance. High loading scales in this factor are: fast (+), moving (+),

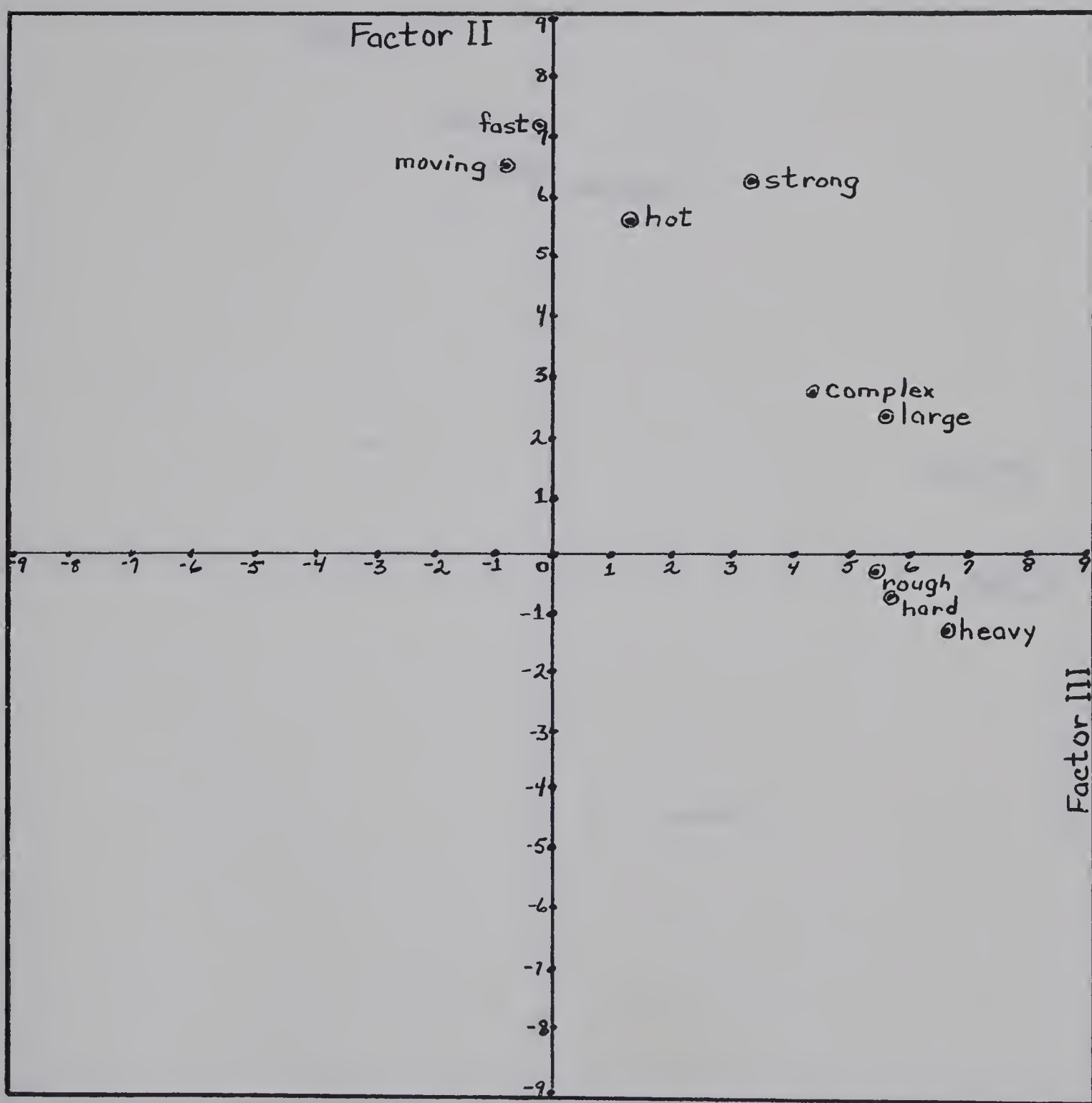


FIGURE 23

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS II & III
SOCIAL STUDIES

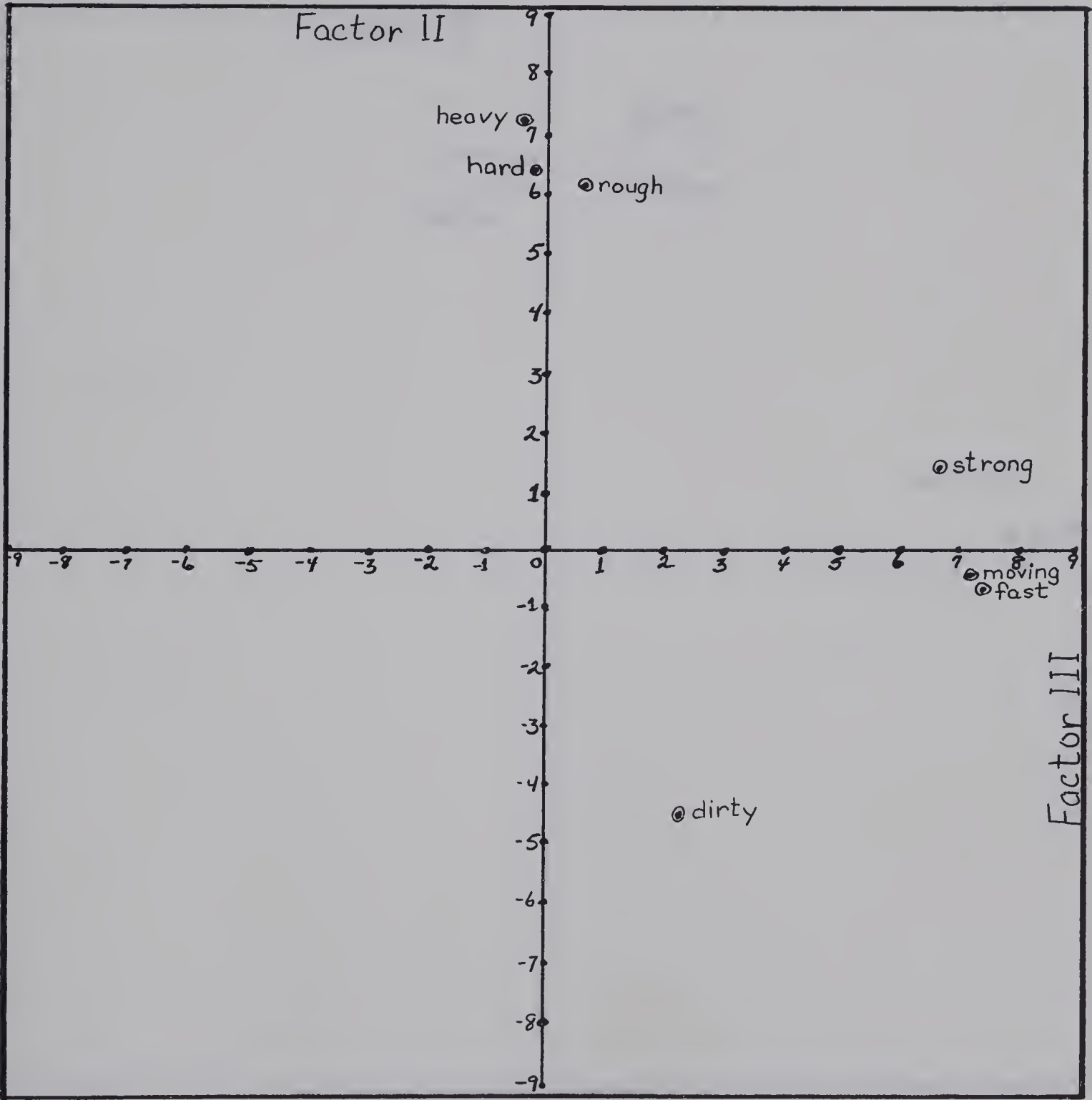


FIGURE 24

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS II & III
LITERATURE

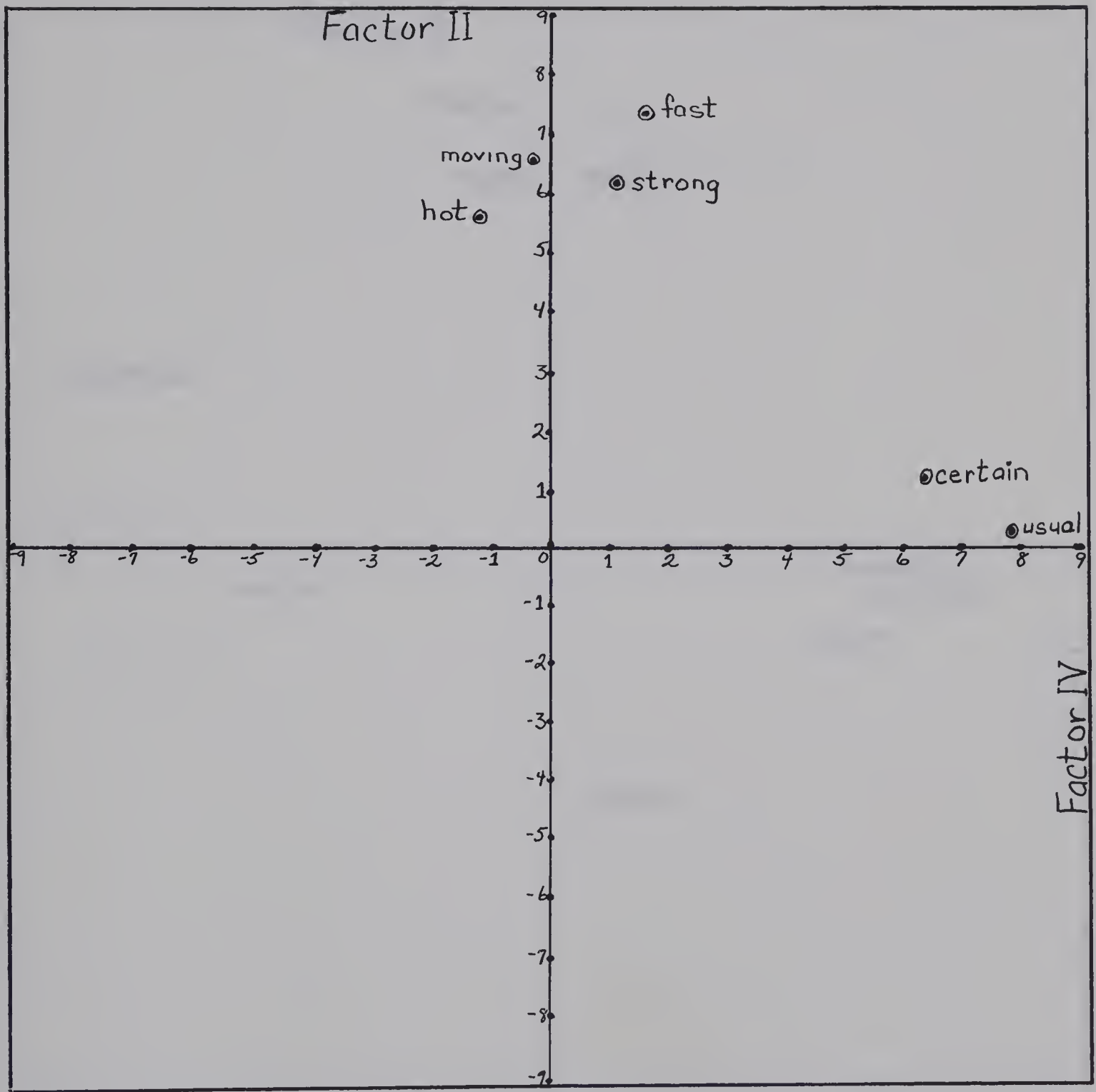


FIGURE 25

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS II & IV
SOCIAL STUDIES

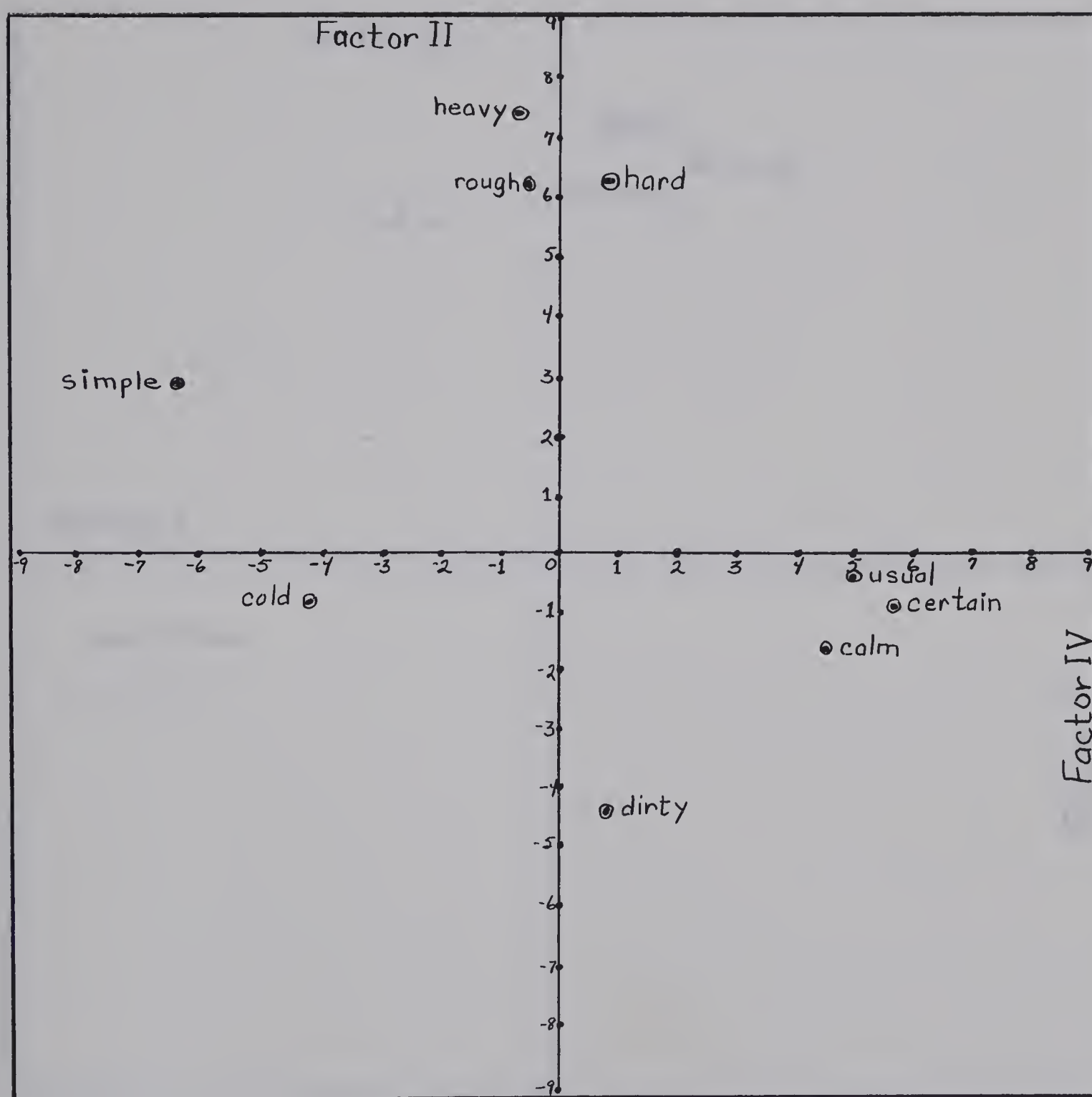


FIGURE 26

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS II & IV
LITERATURE

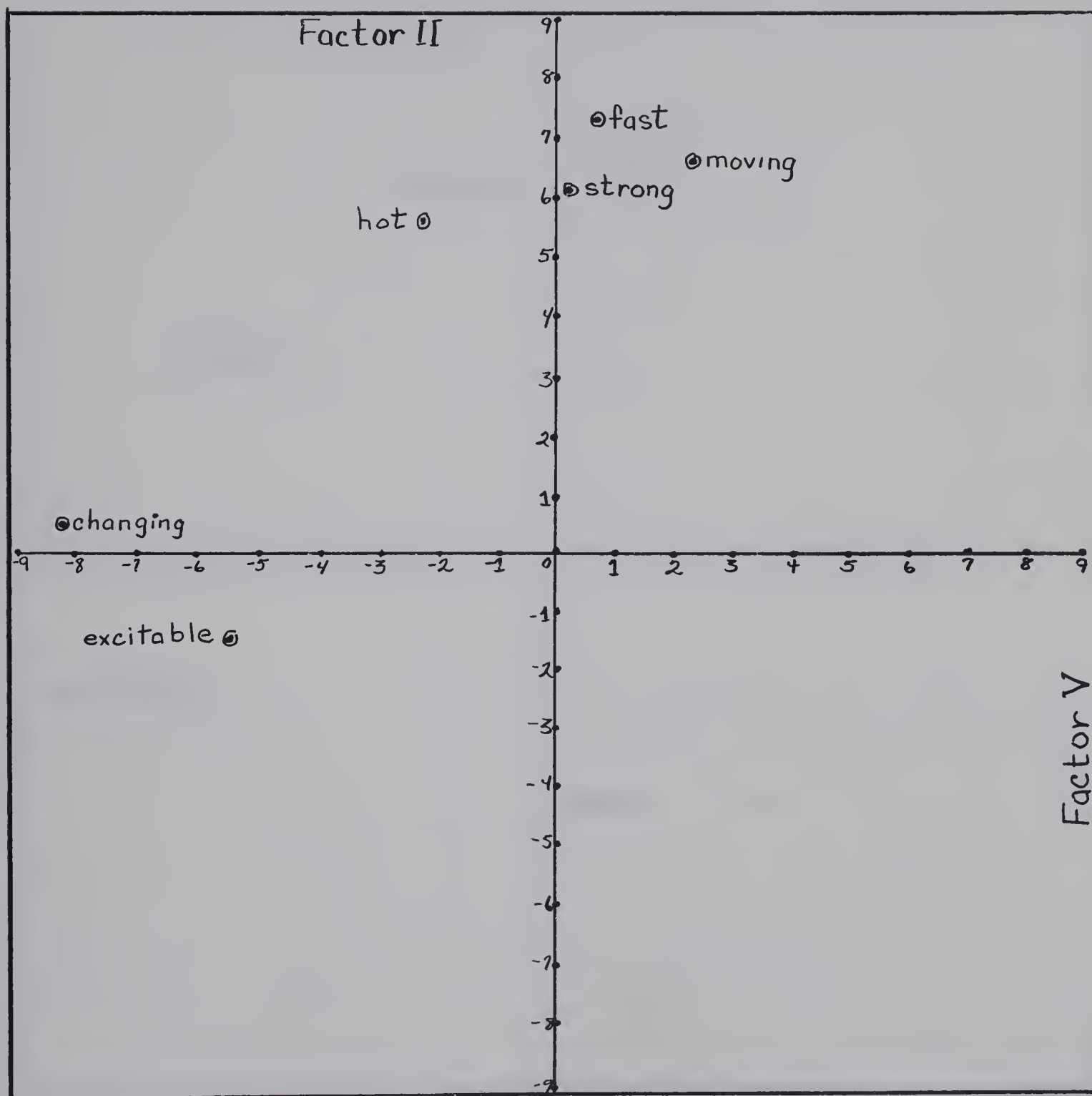


FIGURE 27

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS II & V
SOCIAL STUDIES

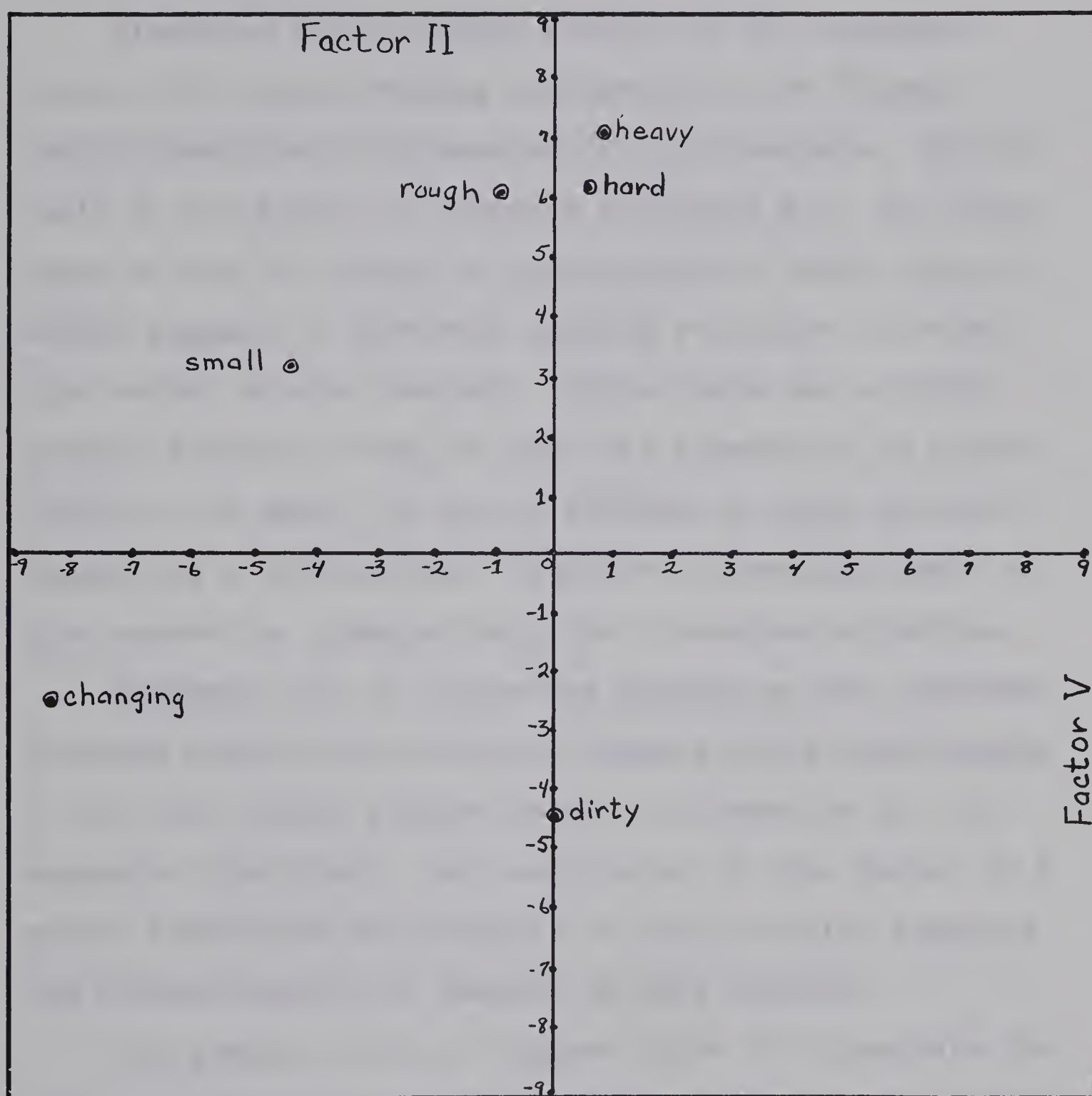


FIGURE 28

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS II & V
LITERATURE

and strong (+). These scales and their rotated loadings are presented in Table XII. Figure 29 pictures the relationships.

Dimension III in social studies is the congruent Potency (P) factor showing similarity to the Potency factor identified in Dimension II in literature. On the basis of the amount of variance accounted for, the occurrence of the (P) factor in third position rather than in second suggests a different meaning structure for words in a social studies context. While there was a strong potency element in the (E) and (OA) dimensions in social studies, the major (P) factor emerges in third position suggesting a differential structure for meaning space in this context as compared with the literature situation.

Dimension III in literature emerges as the congruent Oriented Activity (OA) factor, bearing close relationship to the (OA) social studies factor in Dimension II. As suggested previously, the positioning of this factor in a manner consistent with results of other studies suggests the conventionality of meaning in this context.

The graphic plots in Figures 30 to 33 illustrate the values of each scale in Factor III and their relationship to Factors IV and V.

Dimensions II and III together account for almost as much of the total variance as Dimension I in contrast to other SD studies (Osgood, 1957; Osgood, 1961; Di Vesta, 1966) where the second and third factors together commonly

TABLE XII

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. III

SOCIAL STUDIES - POTENCY					LITERATURE - ORIENTED ACTIVITY				
Adjective Scale	Po*	F*	Load- ing	h^2	Adjective Scale	Po	F	Load- ing	h^2
heavy light	+	P*	686#	534#	fast slow	+	A	734	551
hard soft	+	P	541	521	moving still	+	A	716	560
large small	+	P	536	368	strong weak	+	P	669	549
rough smooth	+	P	533	540					
complex simple	+	A*	412	319					
TOTAL VARIANCE			9.145		TOTAL VARIANCE			9.318	

*Po - Polarity

F - Factor Loading

P - Potency

A - Activity

Decimal Point Omitted

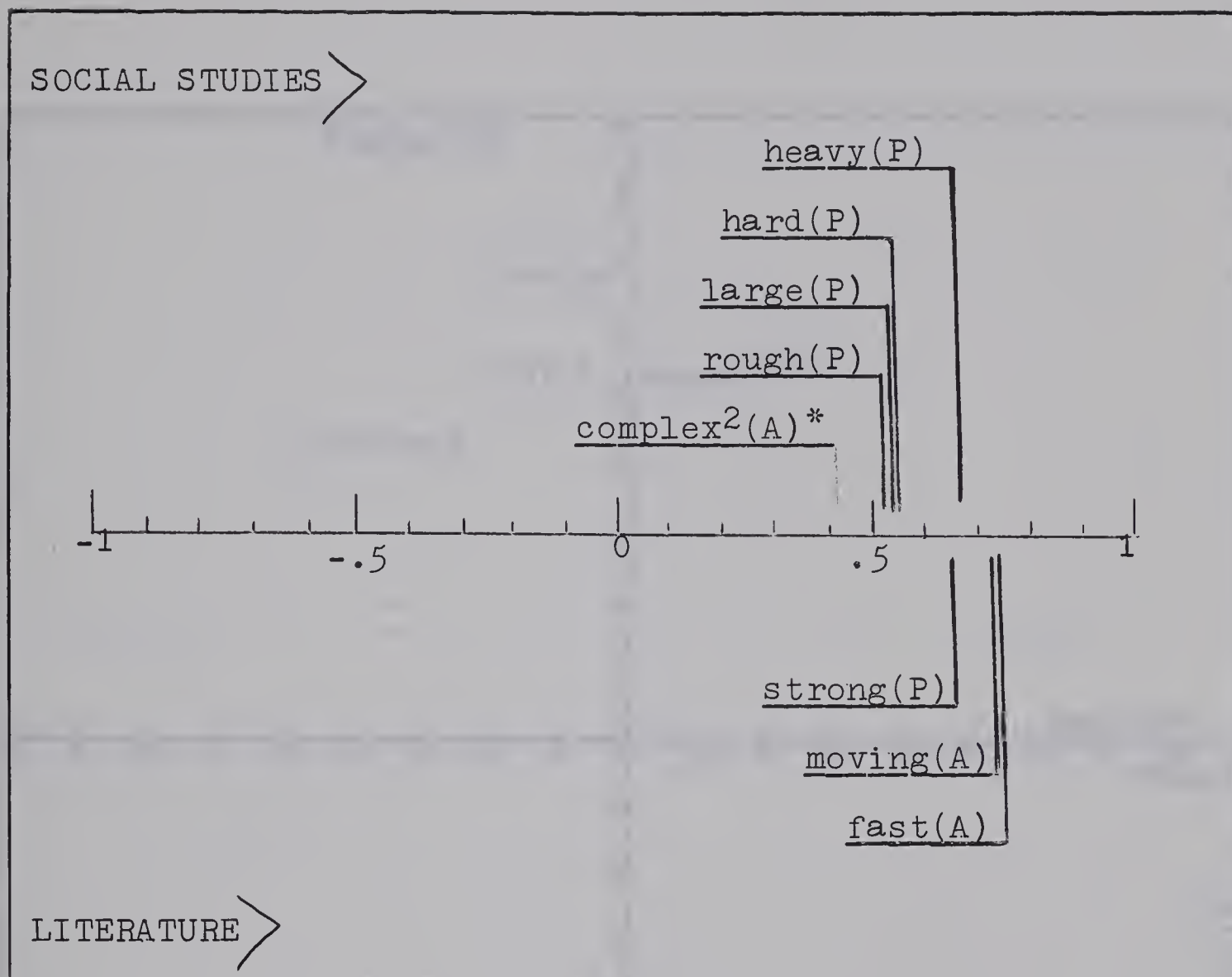


FIGURE 29

FACTOR LOADINGS¹
 DIMENSION III
 SOCIAL STUDIES - POTENCY
 LITERATURE - ORIENTED ACTIVITY

*A - Activity
 P - Potency

- ¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity in diagramming

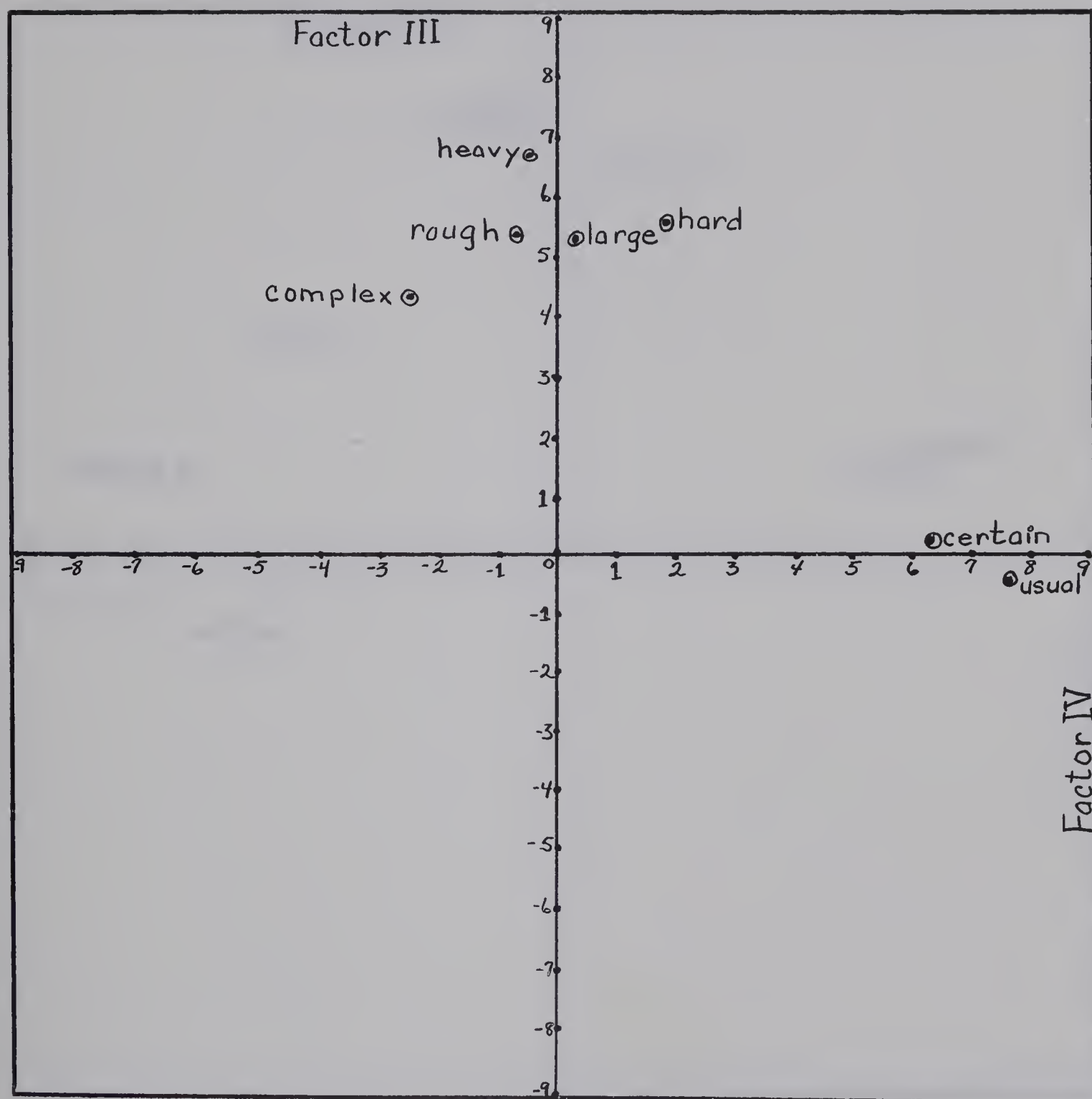


FIGURE 30

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS III & IV
SOCIAL STUDIES

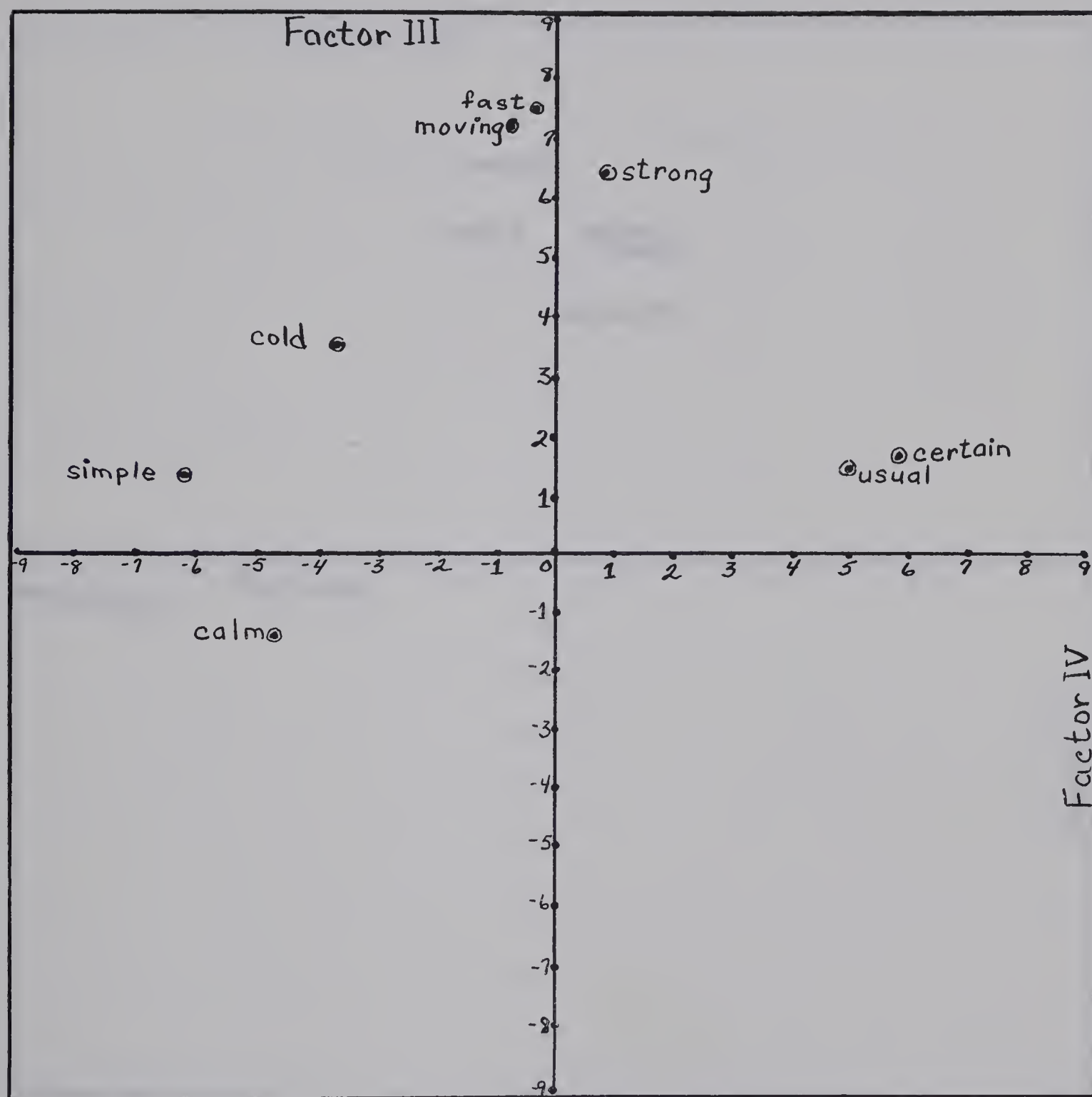


FIGURE 31

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS III & IV
LITERATURE

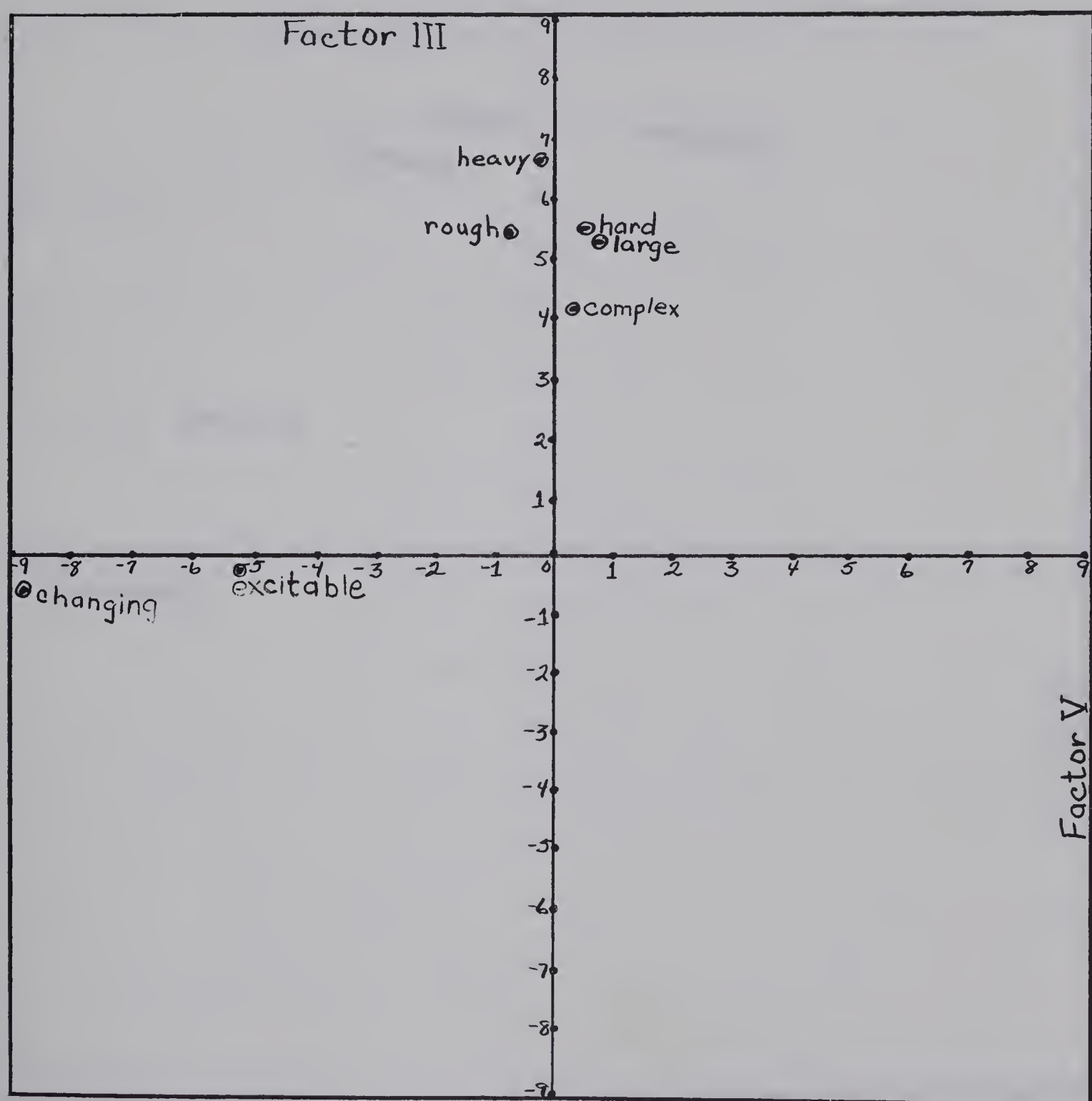


FIGURE 32

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS III & V
SOCIAL STUDIES

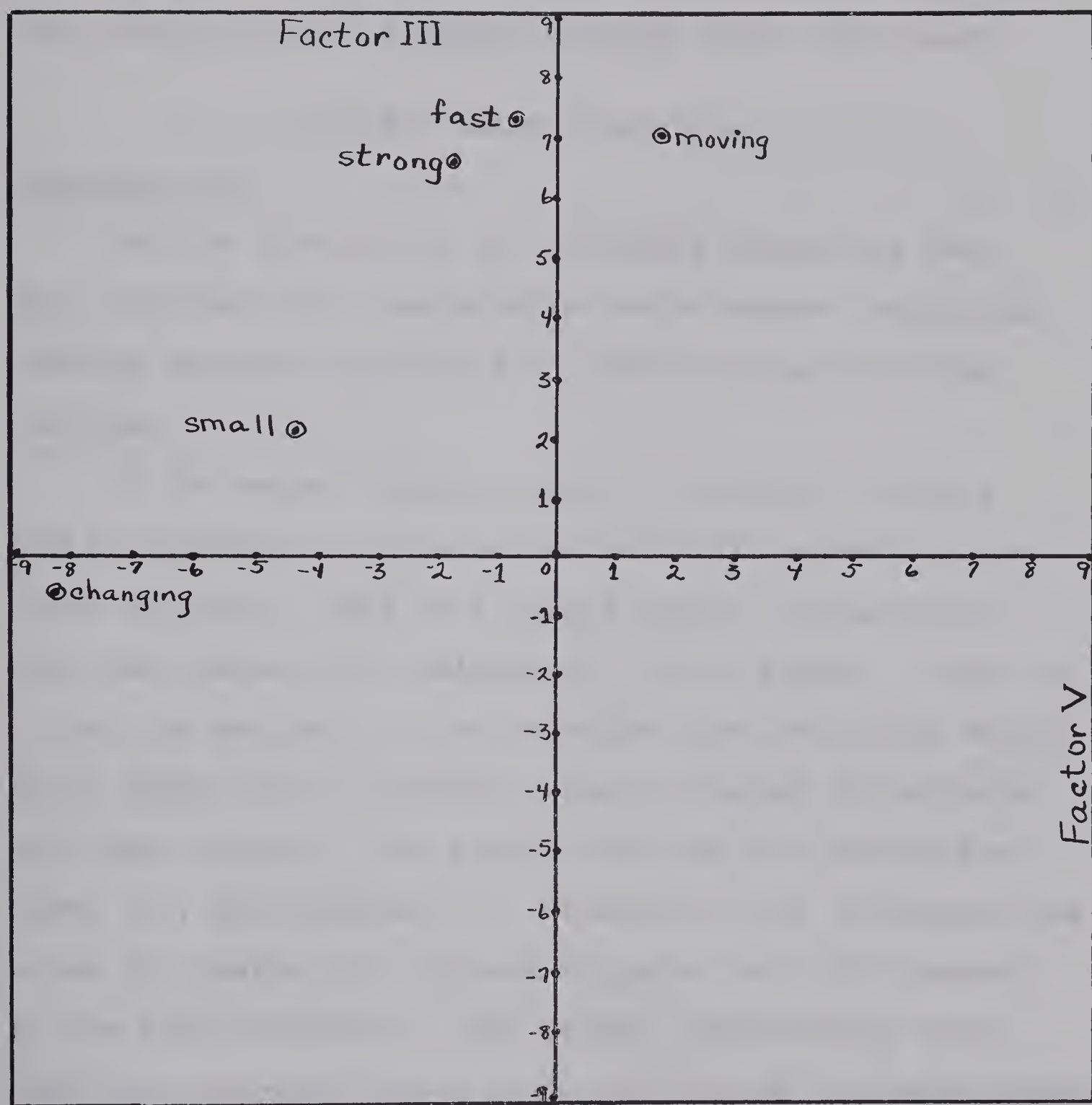


FIGURE 33

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS III & V
LITERATURE

account for less than two-thirds of the variance of the first factor. This event suggests a greater breadth of meaning of concepts when considered in specific contexts thus adding to the influence of words upon their users.

(b) Secondary Dimensions

Dimension IV

Factors obtained in the secondary dimensions have been labelled with considerable tentativeness, employing loading patterns discovered in other studies involving children.

In the social studies context Dimension IV with a sum of squares of .993 accounts for 7.752 percent of the total variance. This is a narrow factor, consisting of only two scales with loadings of .400 or higher. (This is in part an artifact of the principal axes factoring method which takes out the greatest possible amount of variance with each factor.) The scales defining this factor are: usual (+), and certain (+). Dimension IV in literature has a sum of squares of 1.355 and accounts for 7.698 percent of the total variance. This factor, considerably wider than the congruent factor in social studies is characterized by the scales: simple (-), certain (+), usual (+), calm (+), and cold (-). The scales and their rotated factor loadings are presented in Table XIII. Figure 34 contrasts Dimension IV in the two contexts.

Within the social studies context, Dimension IV has been identified as a Novelty (N) factor on the basis of

TABLE XIII

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. IV

SOCIAL STUDIES NOVELTY					LITERATURE NOVELTY-STABILITY				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
usual unusual	+	N*	778 [#]	635 [#]	simple complex	-	S*	629	542
certain uncertain	+	N	623	539	certain uncertain	+	N	579	483
					usual unusual	+	N	500	376
					calm excitable	+	S	455	279
					cold hot	-	A*	409	302
TOTAL VARIANCE			7.752		TOTAL VARIANCE			7.698	

*Po - Polarity
 F - Factor Loading
 N - Novelty
 S - Stability
 A - Activity
[#] Decimal Point Omitted

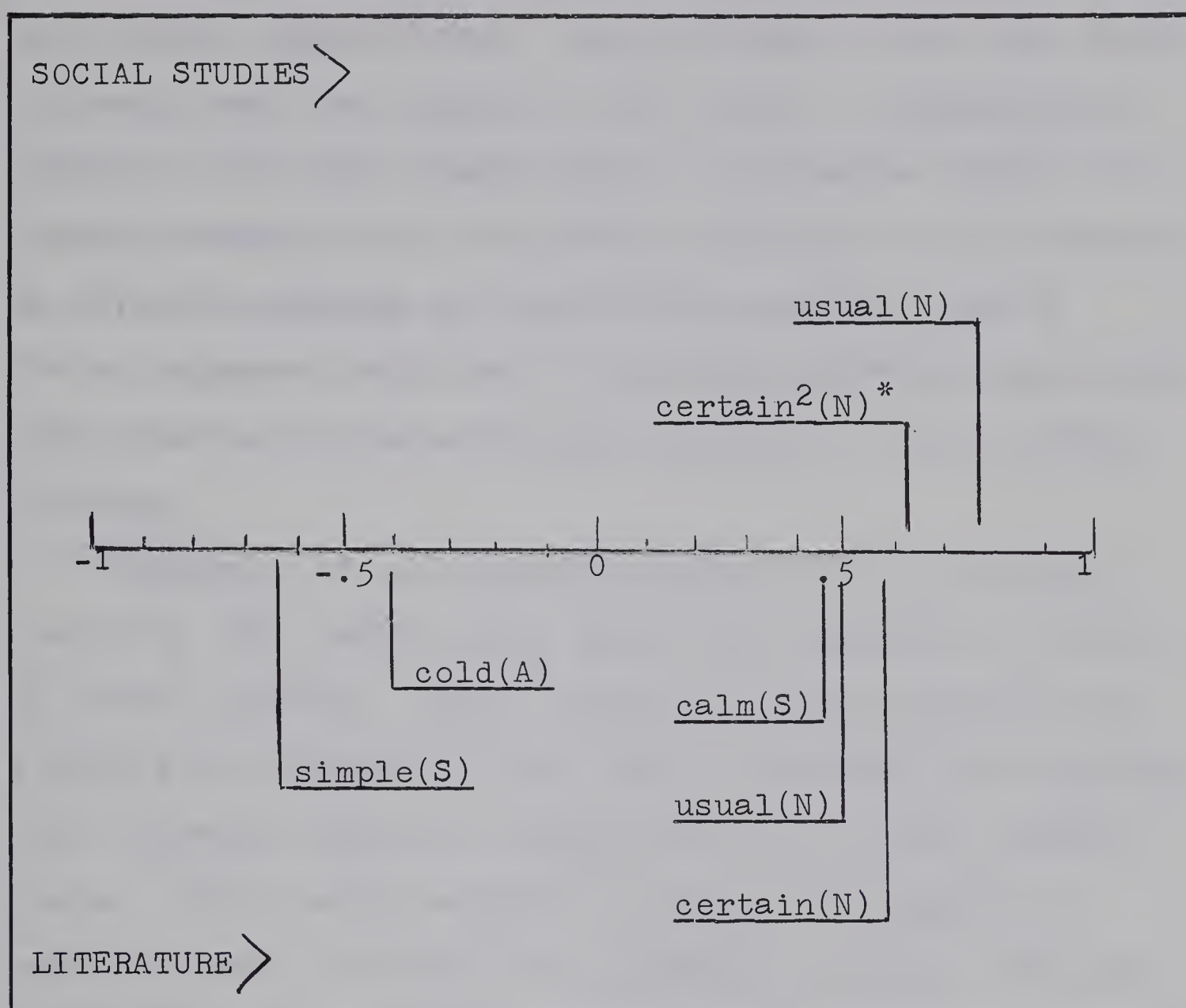


FIGURE 34

FACTOR LOADINGS¹
 DIMENSION IV
 SOCIAL STUDIES - NOVELTY
 LITERATURE - NOVELTY-STABILITY

*A - Activity
 N - Novelty
 S - Stability

¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity in diagramming

scales found to define this factor in other studies. This is a rather narrow factor, being defined by only two scales although they load highly on this factor. Communalities indicate that these scales share a substantial amount of common variance with this measure providing in this factor an effective measure of connotative meaning. The (N) factor suggests that aura of certainty generally associated with powerful forces and events central to social studies thinking.

Dimension IV in literature appears to be a Novelty-Stability (NS) factor quite unlike the Dimension IV factor in social studies. Scales loading on both stability and activity are present in this factor providing for considerably increased width as compared with the social studies factor. This factor appears to describe an aspect of meaning common to words in a literature context. This is the aspect of simplicity and calmness in association with the certainty of events occurring under the control of an author.

The contrast between factors in Dimension IV is indicative of the importance of the secondary dimensions in adding to the findings of this study. These factors identify what appear to be unique components of meaning in different contexts. Thus while the primary dimensions account for the greater portion of the variance those lesser areas of meaning indexed by the secondary dimensions are believed to fill in the vital details in the general

structure of meaning created by the primary dimensions. Also, it is suggested that these elements of meaning may to some degree control the functioning of the principal dimensions which are considered to be fundamental attributes of human response as a function of meaning. This contention will be discussed in later sections of the analysis.

The graphic plots in Figures 35 and 36 illustrate the values of scales and their relationships to the factors.

Dimension V

Two relatively unique variations of the same general factor are produced in this final dimension. In the social studies context Dimension V with a sum of squares of .959 accounts for 5.835 percent of the total variance. This and the congruent factor in literature are both narrow, consisting of two scales each. The scales which identify this factor are: changing (-), and excitable (-). Dimension V in literature has a sum of squares of .918 and accounts for 5.780 percent of the total variance. Scales characterizing this factor are: changing (-), and small (-). The scales and their rotated factor loadings are given in Table XIV. Figure 37 illustrates the relationship of the elements of these two factors.

Factor V in both contexts has been designated a Stability (S) factor although the literature (S) factor has a potency element distinguishing it from its congruent social studies factor.

The appearance of the stability factor as the final

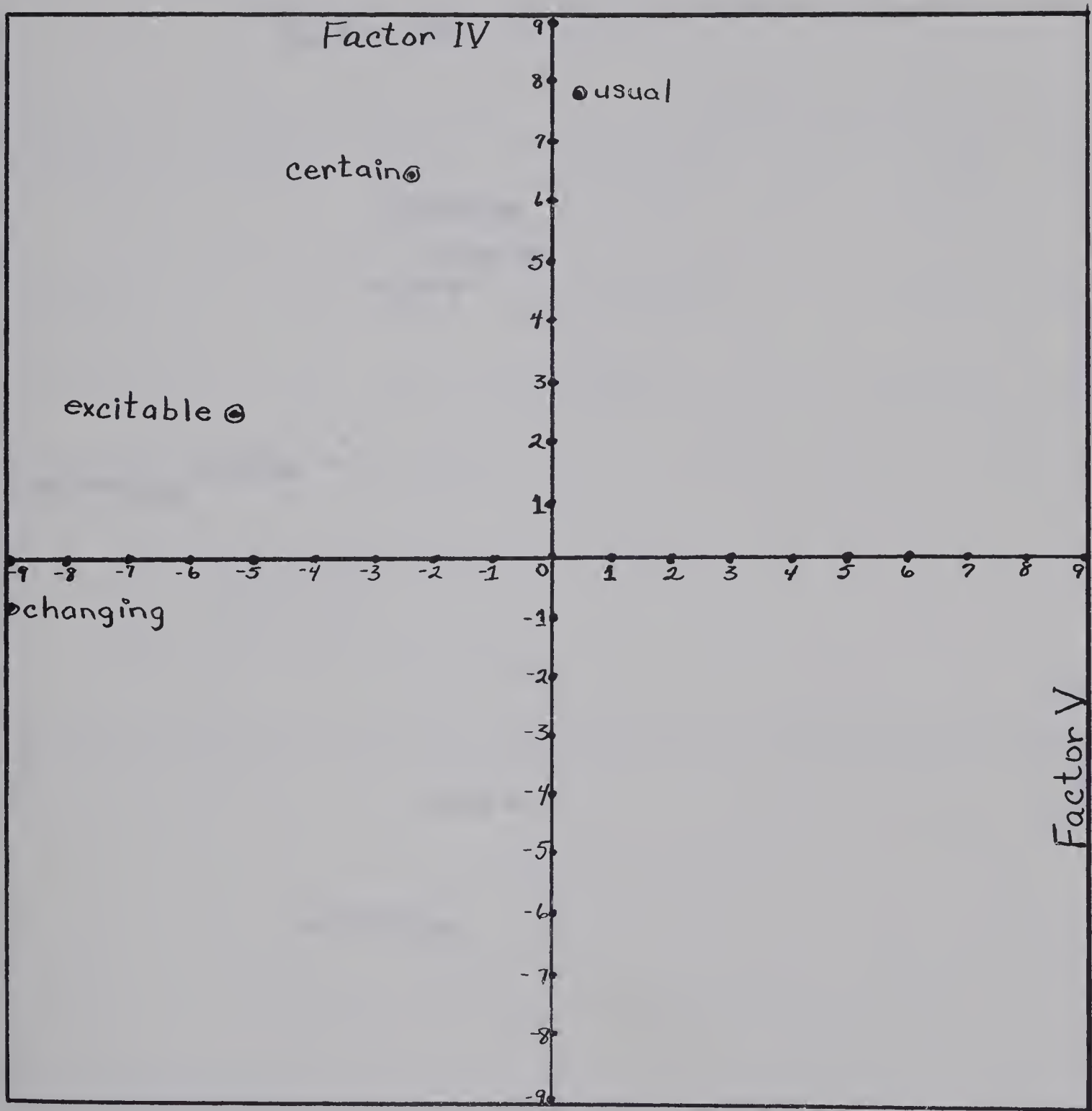


FIGURE 35

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS IV & V
SOCIAL STUDIES

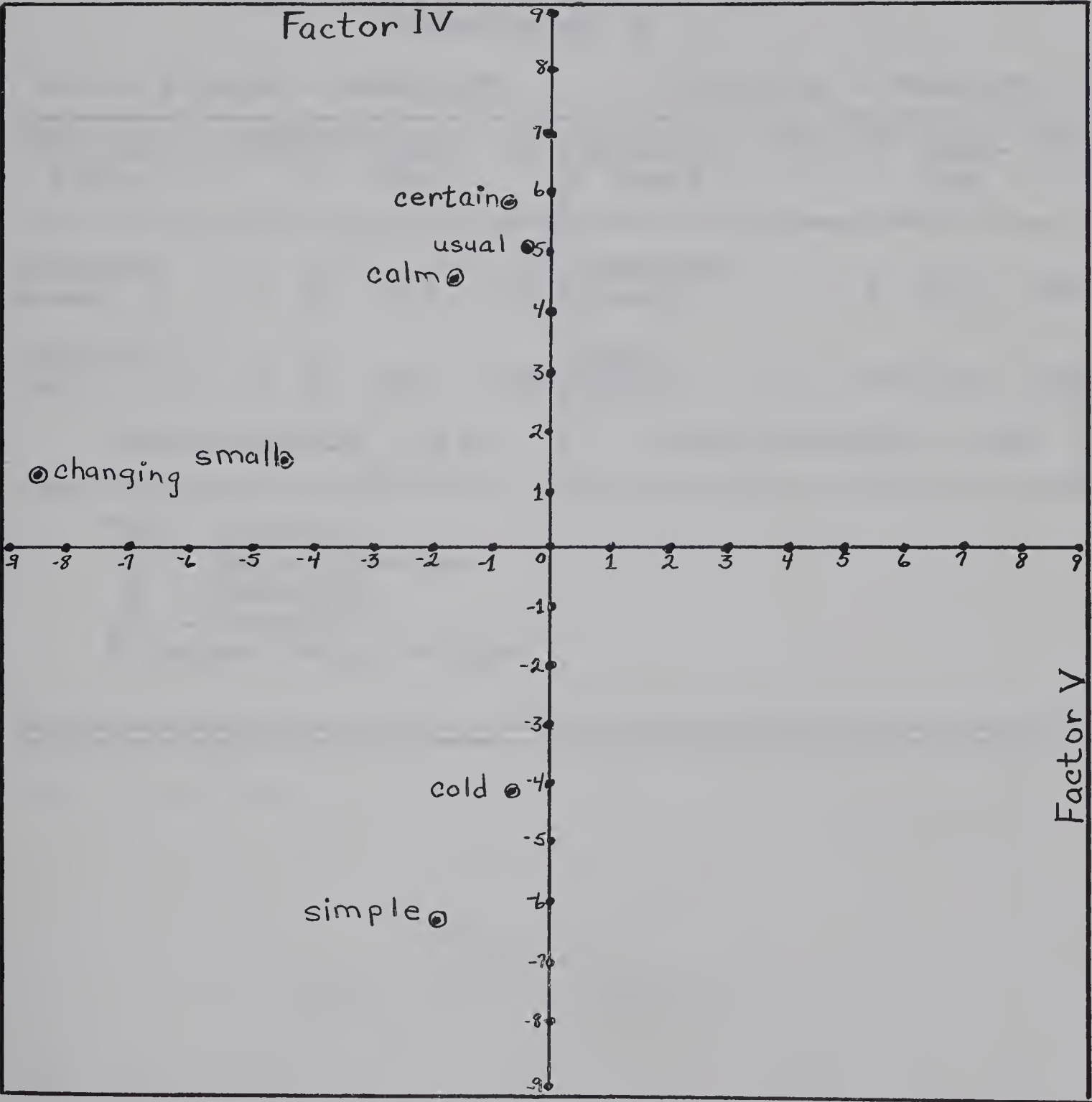


FIGURE 36

GRAPHIC ILLUSTRATION OF THE RELATION BETWEEN FACTORS IV & V
LITERATURE

TABLE XIV

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. V

SOCIAL STUDIES - STABILITY					LITERATURE - STABILITY				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
changing steady	-	S*	843	721	changing steady	-	S	819	780
excitable calm	-	S	502	338	small large	-	P*	472	440
TOTAL VARIANCE			5.835		TOTAL VARIANCE			5.780	

*Po - Polarity

F - Factor Loading

S - Stability

P - Potency

Decimal Point Omitted

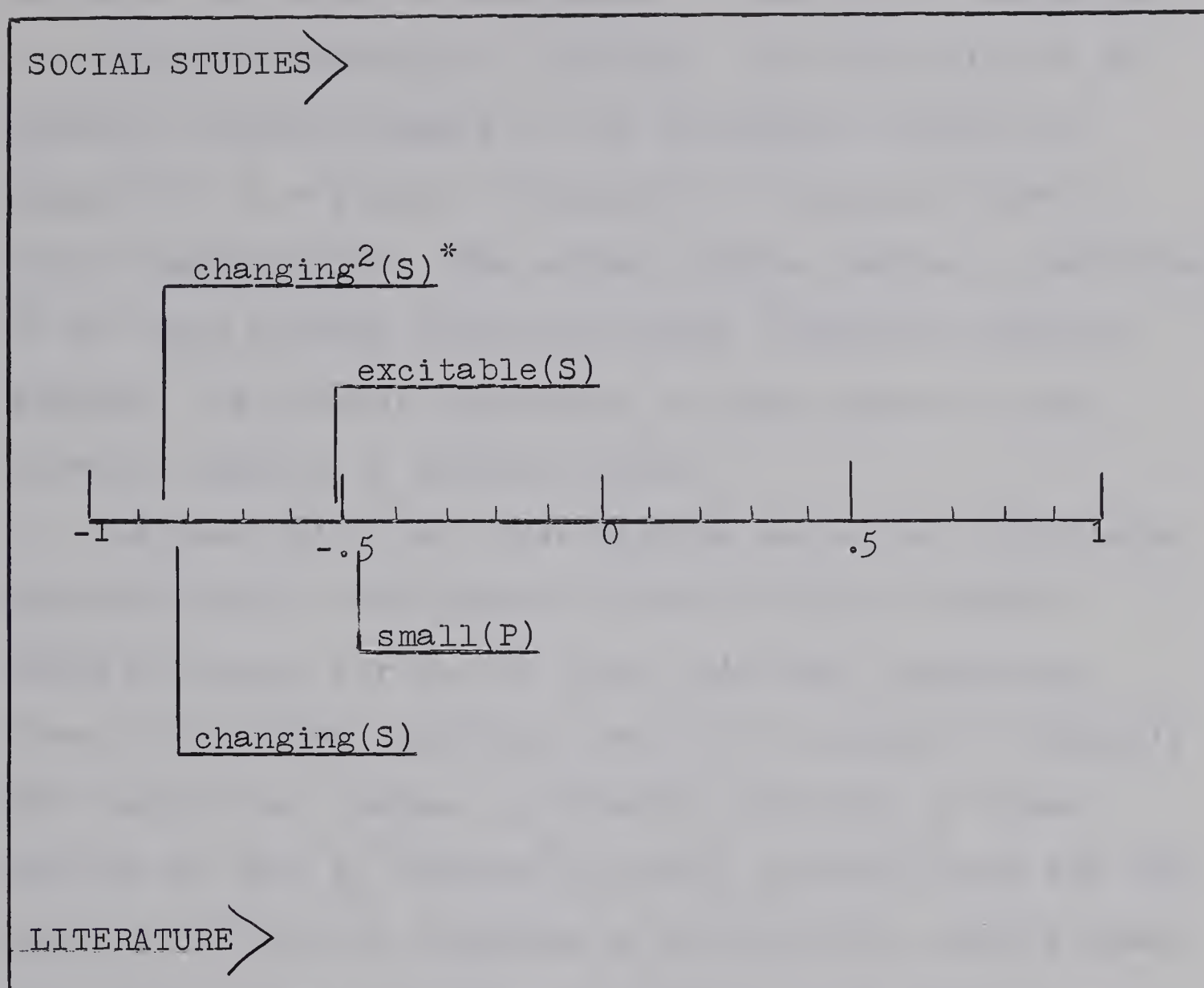


FIGURE 37

FACTOR LOADING¹
 DIMENSION V
 SOCIAL STUDIES - STABILITY
 LITERATURE - STABILITY

*S - Stability
 P - Potency

- ¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity of diagramming

one adding substantially to the variance appears to indicate its relative importance in the child's assigning of connotative meaning to concepts. The inclusion of a negative potency element in the literature context is suggestive of a general "weakness" of concepts added to their changeability. The social studies factor, consisting of two high loading stability scales (negative polarity) suggests the greater importance of this aspect of connotative meaning in social studies.

In conclusion, all five factors extracted contributed substantially to the variance with the major portion being accounted for by the three principal dimensions. These first three dimensions were very similar to Osgood's EPA factors but changes in relative position of these factors as well as changes in scales defining them and the loading differences suggested a differential meaning space for concepts as a function of context. The results of analysis show children to ascribe similar kinds of connotative meaning to concepts as identified in other studies, while the previously mentioned variations in factor structure between contexts are held to be suggestive of the influence of a systematic variable-context.

An examination of the qualitative differences indicated by the above variations will follow in the succeeding section.

V. DISCUSSION

The preceding section examined the quantitative relationships existing within and among scale factors in the two contexts. What follows is an attempt to evaluate qualitatively these relationships and discuss the underlying cognitive processes which appear to eventuate in the observed results.

The bases of comparison and evaluation are twofold: the amount of variance accounted for by the factors, and the nature and importance of the elements comprising these factors.

As indicated in Table VII, the five factors extracted from the data account for more than one-half of the total variance. Individually, these factors account for variance ranging from 21.784 percent to 5.780 percent, depending on the factor and the context. Table XV indicates the relative importance of each factor in each context. The significance of this illustration is in the indication of change in rank order of Factors 2 and 3 in the literature context as well as the generally greater amount of variance accounted for by congruent factors in the social studies context.

The factorial composition among dimensions in the two contexts has been indicated in tables and figures in the preceding section and will be discussed below.

The Varimax Rotated Scale Factors used as basic data in this study indicate three major findings:

TABLE XV

RELATIVE IMPORTANCE OF THE FIVE EXTRACTED FACTORS
AMOUNT OF VARIANCE ACCOUNTED FOR BY EACH FACTOR

Context	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Total %
Social Studies	E* 21.784	OA 9.885	P 9.145	N 6.752	S 5.835	53.401
Literature	E 19.845	P 9.740	OA 9.318	NS 7.698	S 5.780	52.382

* E - Evaluation
OA - Oriented Activity
P - Potency
N - Novelty
NS - Novelty Stability
S - Stability

- (1) The total variance accounted for by the factors extracted varies with the context suggesting greater meaningfulness of concepts in certain contexts.
- (2) The three principal factors in each context are highly congruent in respect to dimensionality while shifts in rank order between contexts are indicative of a differential semantic space in each situation.
- (3) Differences within and between principal factors and the nature of secondary factors also contribute to the differential nature of connotative meaning in different contexts.

With respect to rank order of factors, the amount of variance accounted for by each is taken as the criterion on the basis of the assumption that this value indicates the relative importance of this element in the psychological decision-making process of the child. This process is postulated to be an attraction-avoidance type of response where positive and negative instances of a given quality and of a certain drive value induce the individual to make certain decisions or responses.

As regards dimensionality of factors, summing over subjects and concepts allows for the identification of global dimensions of meaning. This procedure also results in a regression toward the mean so that individual variations are largely depressed. Consequently differences in dimensionality or width of factors is decreased so that small differences must be considered important in indicating

differential semantic structures.

In identifying factors, only loadings of .400 and higher have been employed on the assumption that scales with lower loadings add little to the structuring of the attraction-avoidance processes suggested above.

Total Variance

The total variance of all factors in each context is indicated in Table XV. It is seen that factors in the social studies setting account for a greater amount of the total variance than they do in the literature situation. On the basis of the assumption that the amount of variance accounted for is indicative of the importance of the process described by the factor(s) the results herein described suggest that concepts in a social studies context are more meaningful.

Concepts in social studies appear to be more completely described (this will also be indicated later by the generally greater width of factors in this context). This result might be explained by the more concrete and objective nature of reality in social studies. Words can be considered to refer to concepts more readily available to sensual perception and verification. Also there is likely to be greater consensus regarding distinguishing characteristics of words in this context.

Principal Dimensions

The three principal dimensions are highly comparable

to those found in other studies and together account for about 40 percent of the total variance. When compared to other studies (Osgood, 1957; Osgood, 1962; Di Vesta, 1966; Harbin & Wright, 1967; and Lilly, 1965) there is an interesting shift in rank order of dimensions (see Table XV). The common order of the first three dimensions is evaluation, potency, activity. This order has been maintained in the literature context but in the social studies setting activity and potency have replaced each other. This change appears to indicate that potency plays a different role in ascribing meaning to a word in social studies than it does in literature.

The order of factors in the literature context, being the same as in most studies, suggests that in general words in this context are assigned a more conventional meaning. On the other hand, the social studies situation appears to place a more "active" connotation upon words. This result is possibly due to a sense of movement (a historical perspective) generated in the social studies context. Furthermore, the more concrete nature of events and personalities in a social studies setting may tend to make the words which represent these concepts appear more active due to their more obvious and objective reality.

As well as differences in the relative importance of factors within the two contexts there are also variations in dimensionality as expressed by scales and their loadings. The number of scales defining a factor are

considered to be indicative of its width and together with the magnitude of loadings of scales on factors are considered another measure of the importance of the factor. Tables IX, XI, and XIII indicate the nature and number of scales defining each of the principal dimension factors. Table VIII indicates the sums of squares of factor loadings. From these tables it can be seen that the social studies context has the majority of factors of greater width and loading.

This feature of social studies factors is a reflection of greater polarization of responses in this context (see Table X). Howe (1965, p. 507) reported that words which are more polarized on the Semantic Differential; i.e., further from the origin or neutral point in their rated connotative meaning, "will tend to elicit higher associative uncertainty, a larger number of different associations" Meaning therefore appears to be generally more complex and broad in the social studies context possibly as a result of a greater number of specific associations of signs and assigns with significates and other signs in this context.

Greater polarization also suggests that words are more meaningful and "intense" (Di Vesta, 1966, p. 222). Words in social studies context are commonly used more concretely than in the literature context thereby developing meanings which are more intense.

Although the principal factors in the two contexts are highly congruent, the presence of high-loading "unique"

scales in some factor in each of the dimensions is considered to show the subtle but important variations in meaning between contexts. These factors, the results of learning occurring in different settings, define the underlying variables and processes which eventuate in response. Rozeboom (1965, p. 343) defines learning as a "... change in a psychological state variable due to experience." He goes on to define state variables or processes as:

...those of its psychological attributes such as habits, values, abilities, personality traits, etc. which transcend -- i.e. reliably persist apart from -- the passing circumstances of the moment and hence include all that is psychologically distinctive about this particular organism independent of its immediate environment. (Rozeboom, 1965, p. 341).

He concludes that these state properties are never themselves aroused, consciously or otherwise, but only serve to make something else arousable. This definition of learning as a function of "state" properties is related to the definitions of connotative meaning used in this study. Therefore one can say that any change in state process or connotative meaning will eventuate in a different kind of meaning and consequently a different kind of response.

The (E) factor in social studies includes the potency scales smooth - rough and soft - hard loading highly in this context but not in the literature one. This result is suggestive of a greater appreciation by the child of the texture, toughness aspect of concepts when they are

found in social studies. The presence of an additional activity scale, hot - cold, in the social studies (OA) factor suggests the more forceful and active view children have of concepts in this context. This is further borne out by the presence of another activity scale, complex - simple, in the social studies (P) factor.

These results suggest the rotation of scales towards an Evaluation-Activity emphasis in social studies and an Evaluation-Potency emphasis in literature. Such concept-scale interaction, as was hypothesized, might be the outcome of the indexing of words in specific situational contexts.

Evidence from the factor match of control group data indicated the controlling influence of context upon semantic space as defined by factor structure. Assuming the adequacy of randomization procedures for control of extraneous variables, data from the experimental sample was not subjected to tests of congruence. Differences identified were assumed to be real, created by the single experimental variable-context.

Secondary Dimensions

While the principal dimensions show a high degree of congruence, the secondary dimensions indicate considerable diversity. This is in part an artifact of the principal axes method of factoring since the greatest amount of variance is taken out with each factor. This results in factors accounting for a smaller amount of variance being comprised of elements or vectors less like each other than

in factors accounting for greater variance. Nonetheless, factors extracted are descriptive of psychological processes in that correlations exist among the elements of these factors.

The two secondary dimensions account for about 13 percent of the total variance, approximately one-third of the variance of the principal dimensions (see Table XV). They, therefore, add measurably to meaning of concepts. The secondary factors, being more nearly unique than the principal factors, appear to measure that aspect of meaning which is more highly emotive and therefore more influenced by context than is the case with principal factors. Each context appeared to produce a qualitatively and quantitatively different set of factors.

The social studies context produced dimensions with a strong sense of the awareness of the commonness and transiency of events in the Novelty and Stability factors extracted. This is contrasted with the simplicity, serenity, and changeability in the Novelty-Stability and Stability factors identified in the reading context.

In other SD studies (Osgood, 1957) secondary factors emerged in the following order: IV. Stability, V. Tautness, VI. Novelty. It is evident in this case that the order of emergence of factors is not the same (see Table XV). Novelty emerges first followed by Stability. This further confirms the effect of specific context upon connotative meaning. It appears that change is a more important

component of meaning than is stability in these contexts and for this age group.

Another interesting result is the apparently greater importance of the stability dimension in literature. Dimension IV in literature has a much broader factor than the congruent social studies factor. The added scales in this factor are ones found to characterize stability factors. These are: simple - complex (the highest loading scale) and usual - unusual. A negatively loaded activity factor, cold - hot, adds to the emphasis on stability in this context. This situation may be the result of a greater freedom of movement in a reading context where subjective emotional responses are more acceptable contrasted with the objective intellectual responses necessary in social studies. (It will be noted that scales are bipolar thus in naming a factor the stability factor, one is assuming a stable-unstable continuum to be present.) Although three of the factors in the secondary dimensions are narrow, consisting of only two scales, the scales load highly on these factors indicating a high degree of saturation.

Implications

The theoretical implications of these results are that context "screens" the kinds of situations and symbols which provide the "contiguous relationships" productive of meaning for concepts. In Carroll's words:

One necessary condition for the formation of a concept is that the individual must have a series of experiences that are in one or more respects similar; the constellation of "respects" in which they are similar constitutes the "concept" that underlies them. (Carroll, 1964, p. 181).

He goes on to say that concepts may include affective components:

Because concepts are embodied in classes of experiences they include all the elements of experience that may occur in common-perceptual and cognitive elements as well as motivational and emotional elements. (Carroll, 1964, p. 181).

The results of this screening process are seen in the factor structure obtained as a result of analysis of concepts indexed within different contexts. In the present study this process has produced concept scale interaction with rotation of scales suggesting a differential emphasis in each context. Also, the amount of meaning extracted from concepts is made to appear a function of context and the type of cognitive operations therein.

These findings point to a number of general implications. As a result of his study Lilly (1965, p. 75) concluded that somewhere between the ages of six and ten verbal mediation becomes important in determining children's reactions to external stimuli. In this event, the mediational process is fairly well developed in the Ss of the present study. Since it is hypothesized that the SD is indexing mediational processes, the results of this study are consistent with those cited above. This suggests that children's mediating processes are fairly well established and influenced by the same sort of situations

which affect adults.

Luria (1960) suggests that language becomes the most important mediator and regulator of the child's own behavior. The results of the present study are suggestive of this observation since children behave differently in different contexts, this behavior, it is hypothesized, being a function of meaning in language.

For Piaget (Kessen & Kuhlman, 1962, p. 24) there are three main stages in cognitive development. The present study would fall within the second stage, the concrete operations stage. Here the children are capable of relating to different dimensions of a situation by reasoning according to a system of operations called groupings (groupments). This study illustrates this operational thinking ability in children.

In order to be rated, concepts must remain invariant under very marked transformations. That is, children must identify the symbols with the real object in different contexts while making the ratings. The concept of classification is also employed since the scale factors are considered as classificatory schemes. The classification is done somewhat differently in the two contexts indicating the ability of students to vary classificatory criteria. This sorting is on a cognitive operational level and therefore illustrates the influence of environmental "content" on conceptual processes.

The three principal dimensions, Evaluation, Activity,

and Potency which are obtained in SD studies can be considered fundamental attributes of an individual's affective functioning. Carroll (1959) has proposed that the Evaluative dimension corresponds to a person's tendency to approach or avoid a stimulus. The second dimension, Activity, would refer to the necessity or nonnecessity for making movements in adjusting to stimuli. Finally, Potency suggests the amount of adjustment to be made or the magnitude of the response necessary to adjust to a stimuli.

Similarly for the secondary dimensions one might suppose that the Novelty dimension is an indication of the individual's examination of things in terms of their familiarity. Stability would then become that dimension which indicates the changeability of concepts and the necessity of one's reclassifying and adjusting to changed stimuli.

The results of this study appear to point to the different orientation one must take, in terms of the above dimensions, to events or concepts in different contexts. This is congruent with a logical interpretation of everyday behavior. Furthermore, on the basis of observed behavior, the nature of meaning dimensions identified also bear a logical relationship to the two contexts examined.

While the principal dimensions can be considered fundamental attributes of psychological functioning, the secondary dimensions might be regarded as the catalytic influence bringing about the approach-avoidance response

encompassing these fundamental behaviors. This postulate would make these dimensions of meaning crucial in the individual's behavior complex and add a degree of clarification to the Weltanschauung problem. Responses to stimuli would then be on the basis of their characteristics as determined by the evaluative, potency, and activity dimensions of meaning but "triggered" by psychical components such as novelty and stability.

VI. SINGLE CONCEPT ANALYSIS

In an attempt to counteract the dampening effect (smoothing out of individual differences) of summing over concepts, an analysis of the responses of the two experimental groups on a single concept was made. The concept selected was the pronoun "yourself", the basis of selection being the requirement that the concept be easily differentiated in each context. Also, it appeared that this concept would be most suitable for providing a basis of measurement of the individual's Weltanschauung as a function of context.

Factor analytic procedures and rotation of extracted factors were performed through use of the same programs as in previous analysis reported in this study. These operations produced twenty factor analyses, one for each concept in each of the two contexts. Examination of these factor structures revealed wide variations from concept to concept and context to context. One difference was the

meaningfulness of concepts as expressed in the amount of variance accounted for. There was considerable variation in this respect. Table XVI illustrates these differences. A second difference was the degree of congruence of factor structures. Evidence regarding these differences is presented in Table XVII and Table XXVI (p. 204). It will be noted that individual concepts when rated in different contexts produce responses which are markedly different. This evidence is held to be direct empirical support for the general hypothesis that individuals perceive reality (as represented by their language) differently in different contexts. The above results are at variance with evidence cited earlier regarding the stability of SD findings and are therefore offered as additional support for the concept of contextual influence upon language and consequently perception of reality.

VII. ANALYSIS AND DISCUSSION - THE CONCEPT "YOURSELF"

In the social studies context there were seven scale factors with eigenvalues ranging from 4.246 to 1.018 accounting for 61.427 percent of the total variance. The literature situation produced six factors with eigenvalues ranging from 3.968 to 1.150 and accounting for 55.270 percent of the total variance. These factors and their values are given in Table XVII. The variances of the factors after rotation (sums of squares of loadings) are presented in Table XVIII. Loading on scales for the

TABLE XVI

MEANINGFULNESS OF CONCEPTS IN DIFFERENT CONTEXTS
AMOUNT OF VARIANCE ACCOUNTED FOR BY FACTORS

Context	Concepts				
	government	power	command	honor	peace
Social Studies	59.888	58.840	65.692	63.184	56.639
Literature	63.067	61.140	62.091	61.882	64.967

Context	Concepts				
	land	wrong	money	kill	yourself
Social Studies	58.624	59.455	55.694	59.536	61.427
Literature	57.670	66.240	60.810	62.998	55.270

TABLE XVII
FACTORS WITH EIGENVALUES GREATER THAN UNITY

<u>Factor</u>	<u>Social Studies</u>	<u>Literature</u>
1	4.246	3.968
2	2.051	1.767
3	1.397	1.535
4	1.243	1.357
5	1.200	1.278
6	1.131	1.150
7	1.018	
<hr/>		
Percent of Total		
Variance	61.427	55.270

TABLE XVIII
VARIANCE ACCOUNTED FOR BY EACH ROTATED FACTOR

<u>Factor</u>	<u>Sum of Squares of Loadings</u>	
	<u>Social Studies</u>	<u>Literature</u>
1	2.932	2.353
2	1.450	1.449
3	1.251	1.624
4	1.090	1.113
5	.799	.890
6	.937	.726
7	1.039	
<hr/>		
Percent of Total		
Variance	61.427	55.270

rotated principal axes factors are listed in Tables XIX, XX, XXI, XXII, XXIII, XXIV, and XXV. These data form the bases of the analysis to follow. Appendix F presents loadings of all scales on all factors.

As in the case of factors derived by summation over concepts, factor loading and scale differences exist between factors in the two contexts. These differences are much more marked in the case of the rating of a single concept producing fewer congruent factors and a greater variation between those factors which are more nearly congruent. Also, as in the previous analysis, the order of factors is altered from context to context. A further difference is the emergence of entirely new factors, formed by a novel combination of scales, heretofore not in evidence in this study.

(a) Principal Dimensions

Dimension I

In the social studies context Dimension I with a sum of squares of 2.932 accounts for 17.288 percent of the total variance. As before, only scales having loadings of .400 or higher are included. Dimension I in literature, with a sum of squares of 2.353, accounts for 13.521 percent of the total variance of meaning. The scales characterizing the factors in this dimension and their rotated loadings are presented in Table XIX.

As in the previous analysis the first dimension to emerge is the Evaluation (E) dimension and once more it

TABLE XIX
PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. I

SOCIAL STUDIES - EVALUATION					LITERATURE - EVALUATION				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
good bad	+	E*	738#	627#	important not important	-	E	707	558
painful pleasurable	+	E	716	676	ugly beautiful	-	E	682	495
dangerous safe	+	N*	637	582	soft hard	+	P*	572	541
kind cruel	+	E	625	578	bad good	-	E	531	560
clean dirty	+	E	574	495	painful pleasurable	-	E	519	388
ugly beautiful	+	E	541	462	certain uncertain	-	N	517	571
important not important	+	E	523	496	kind cruel	-	E	492	535
usual unusual	+	N	427	603					
TOTAL VARIANCE			17.288		TOTAL VARIANCE			13.521	

*Po - Polarity
F - Factor Loading
E - Evaluation
N - Novelty
P - Potency
Decimal Point Omitted

accounts for the greatest amount of variance but by a considerably smaller amount. Differences in scales and loadings again provide a measure of the differences in meaning between contexts. Figure 38 diagrams this dimension in the two contexts.

The decreased amount of variance accounted for by this dimension suggests its lesser importance in ascribing meaning to the concept of self than to concepts generally. Perhaps it is that things and events external to oneself are more amenable to evaluation than is the individual himself. Also, the greater amount of variance accounted for by this dimension in a social studies context suggests that there is more agreement among respondents regarding the nature of the individual in a social studies context. The concept of self appears to be perceived differently in each context indicating a differential reality in each situation.

Differences within the factors also offer support for this view. Factor loading differences favoring the social studies context (see Table XVIII) attest to the greater importance of scales in this context. Unique scales: clean - dirty, safe - dangerous and usual - unusual in social studies as well as soft - hard, and certain - uncertain in literature tend to produce a somewhat distinctive (E) factor in each context. This suggests an altered "verbal screen" for processing reality.

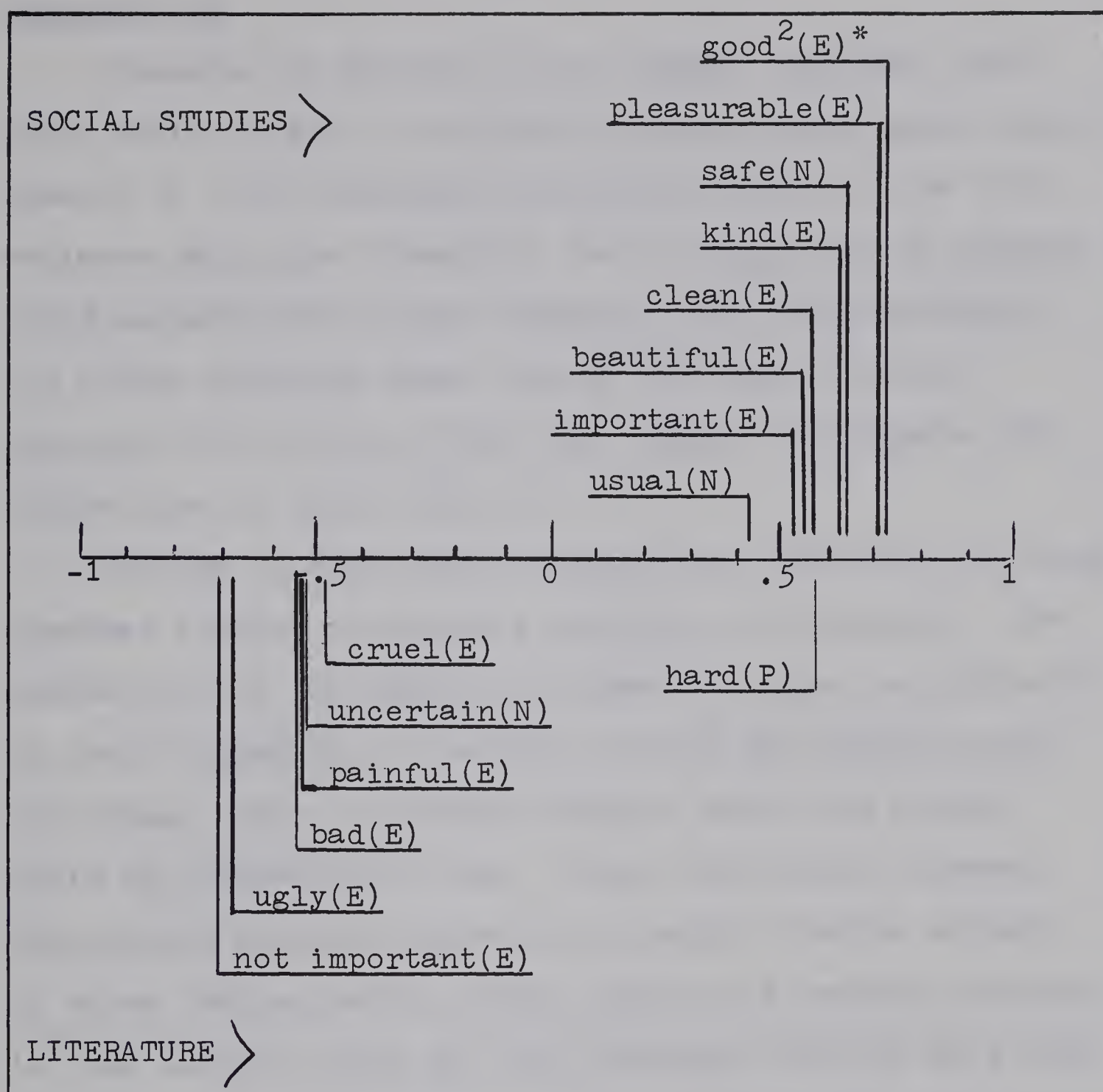


FIGURE 38

FACTOR LOADINGS¹
 DIMENSION I
 SOCIAL STUDIES - EVALUATION
 LITERATURE - EVALUATION

*N - Novelty
 E - Evaluation
 P - Potency

¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used
 for simplicity in diagramming

Dimension II

Dimension II factors are not highly congruent (see Table XXVI, p. 204). The social studies factor with a sum of squares of 1.470 accounts for 10.314 percent of the total variance while the literature factor with a sum of squares of 1.449 accounts for 10.231 percent of the total variance. The scales defining these factors and their rotated loadings are listed in Table XX. Figure 39 diagrams the composition of these factors.

Factors in both contexts have been identified as being somewhat similar to Osgood's Activity (A) dimension. The composition of the factors in terms of scales is indicative of their disparity. In social studies the pivotal scale is strong - weak, a potency element, while the pivotal scale in literature is fast - slow, an activity element. This strong potency coloration in social studies appears to be an indication of a major pattern of meaning structure in this context since the two subsequent factors have been identified as two somewhat different kinds of potency factors. Furthermore, the presence of the scale moving - still in the literature context and its lack of emphasis in social studies is suggestive of a greater underlying emphasis on action in literature.

A further difference in the overall structure of meaning space is suggested by the presence of a second activity factor in social studies, being located in fifth position on the basis of amount of variance. This

TABLE XX

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. II

SOCIAL STUDIES - ACTIVITY					LITERATURE - ACTIVITY				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
strong weak	-	P*	832#	733#	fast slow	-	A	781	607
fast slow	-	A*	731	664	strong weak	-	P	766	650
hot cold	-	A	493	515	moving still	-	A	502	573
TOTAL VARIANCE 10.314					TOTAL VARIANCE 10.231				

*Po - Polarity

F - Factor Loading

A - Activity

P - Potency

Decimal Point Omitted

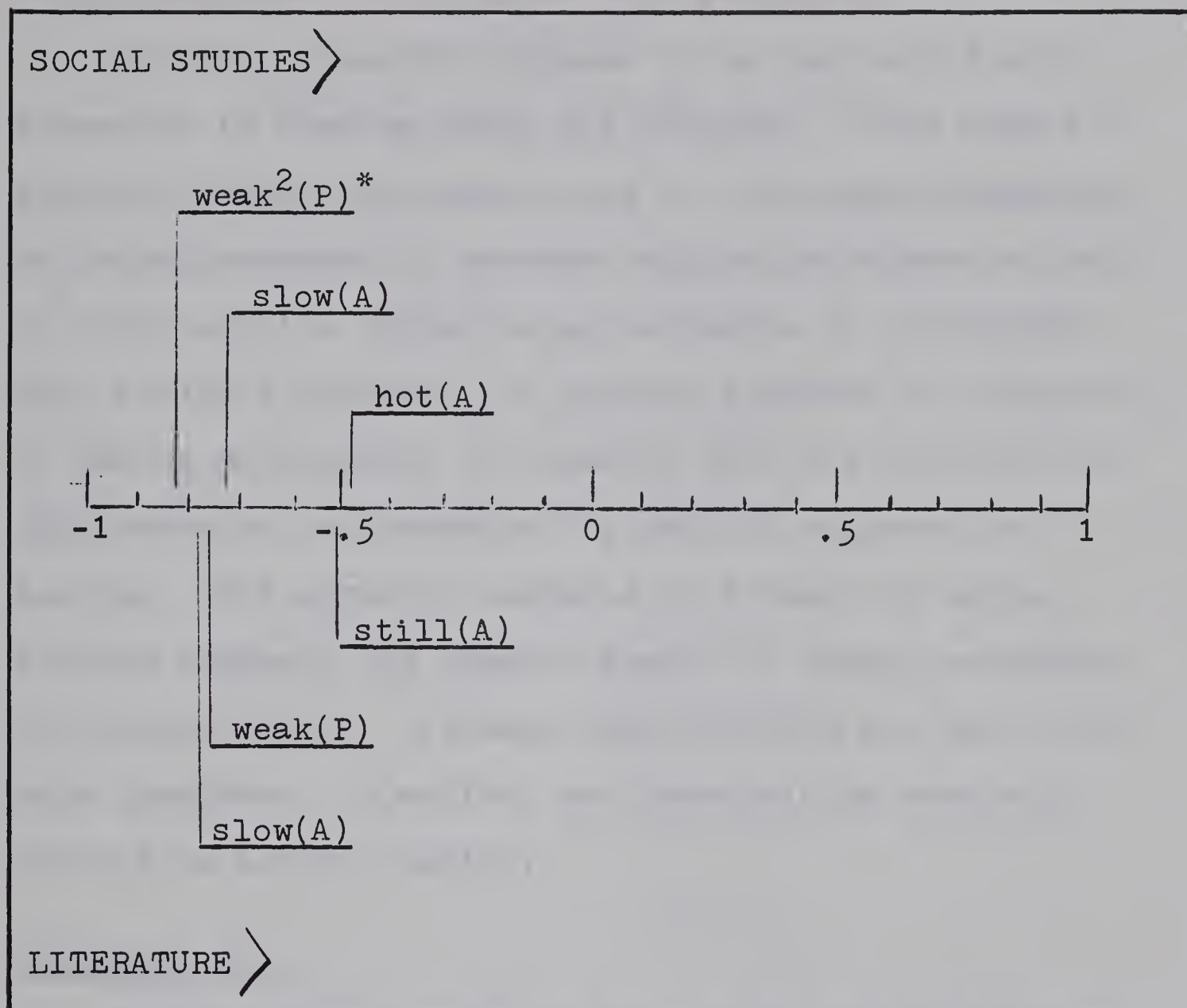


FIGURE 39

FACTOR LOADINGS¹
 DIMENSION II
 SOCIAL STUDIES - ACTIVITY
 LITERATURE - ACTIVITY

*A - Activity
 P - Potency

- ¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity in diagramming

organization is not evident in literature where a unique factor Tautness (T) occupies this position.

Activity therefore appears to be the second major dimension in meaning space for children. They appear to perceive things and events, and in this case themselves, as being possessed of movement and action almost as much as they perceive things being favorable or unfavorable. This activity component of meaning suggests the necessity of making adjustments to behavior once the direction of this behavior is determined by the (E) component of meaning. The apparent emphasis on Potency in social studies suggests the greater degree of change necessary in social studies. Perhaps these results are due to the more immediate, objective, and constraining nature of reality in social studies.

Dimension III

Meaning space begins to take on an entirely unique structure in each context with this dimension. There are no congruent factors in the remaining dimensions of meaning space.

The social studies factor, the first of two highly similar ones, with a sum of squares of 1.251 accounts for 7.374 percent of the total variance. Dimension III in literature is comprised of a factor with a sum of squares of 1.624 accounting for 9.511 percent of the variance. These factors are presented visually in Table XXI and Figure 40.

TABLE XXI

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. III

SOCIAL STUDIES - POTENCY ONE					LITERATURE - NOVELTY				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
large small	+	P*	815 [#]	671 [#]	steady changing	-	S*	703	562
light heavy	+	P	766	708	light heavy	+	P	536	460
					usual unusual	+	N*	473	424
					dangerous safe	+	N	469	614
					moving still	+	A*	452	573
					certain uncertain	+	N	441	571
TOTAL VARIANCE 7.374					TOTAL VARIANCE 9.511				

*Po - Polarity

F - Factor Loading

A - Activity

N - Novelty

P - Potency

S - Stability

[#] Decimal Point Omitted

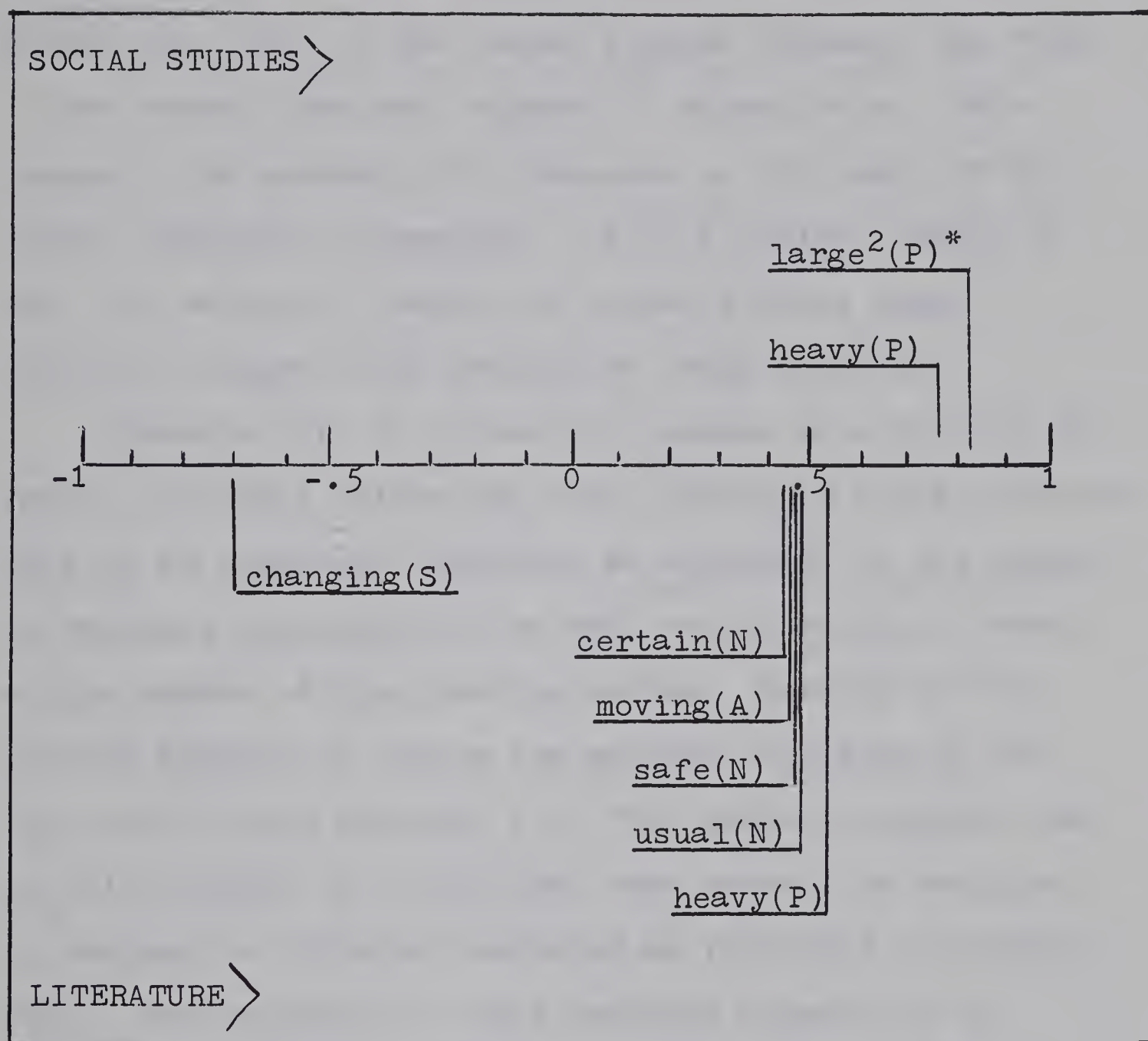


FIGURE 40

FACTOR LOADINGS¹
 DIMENSION III
 SOCIAL STUDIES - POTENCY ONE
 LITERATURE - NOVELTY

*A - Activity
 N - Novelty
 P - Potency
 S - Stability

¹ Only loadings .400 or higher are diagrammed

² Only one end of the adjective scale is used for simplicity in diagramming

It is clearly evident from the structure of these factors that meaning is becoming more differentiated. Potency One (P_1) in the social studies context, the first of two potency factors, appears to stress size. This suggests the necessity for response on the basis of the "size" component of meaning. It is a logical result in that the nature of reality in social studies might certainly suggest this feature as being important.

Dimension III in literature emerges as a Novelty (N) factor, entirely unlike the third factor in social studies. This is an important dimension as witnessed by the amount of variance accounted for as well as its width in terms of the number of high loading scales. Novelty in this context appears to follow the pattern initiated by the (A) factor which preceded it. This pattern suggests that in this context the individual sees himself as required to respond to concepts evaluated as favorable or unfavorable. The necessity of this response appears to be indicated by such underlying components of meaning as activity and the present (N) factor which is concerned with the familiarity of the concept. This familiarity dimension replaces the potency one in social studies as a partial determiner of meaning and subsequent response.

Reality in a literature context, therefore, appears to be less "potent" than that in social studies; in other words, the child's concept of self is seen to be more influenced by the "familiarity" of reality than by "size".

(b) Secondary Dimensions

Dimension IV

Meaning continues its divergent development in the two contexts with this dimension. The social studies factor in Dimension IV with a sum of squares of 1.090 accounts for 6.782 percent of the total variance and has been designated the Potency Two (P_2) factor. Dimension IV in literature with a sum of squares of 1.113 and accounting for 8.266 percent of the total variance is one of the two unique factors to emerge in this portion of the analysis. This factor has been named the Security (SEC) factor. Dimension IV is pictured in Table XXII and Figure 41.

Potency continues to be important in ascribing meaning to concepts in the social studies context. (P_2) appears to be a "texture" factor as opposed to a "size" factor in (P_1). It appears that the more objective reality perceived in a social studies context is more amenable to definition in terms of potency than is the more subjective reality of the literature context. As suggested previously, this factor may find its purpose in determining the degree of response to the meaning of concepts.

Dimension IV in literature, the (SEC) factor, appears to be a further component of the pattern suggested by Dimension II. This factor appears to be related to the degree of confidence generated by concepts, therefore it

TABLE XXII

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. IV

SOCIAL STUDIES - POTENCY TWO					LITERATURE - SECURITY				
Adjective Scale	Po*	F*	Load- ing	h^2	Adjective Scale	Po	F	Load- ing	h^2
soft hard	-	P*	788 [#]	712 [#]	rough smooth	+	P	778	632
smooth rough	-	P	550	576	complex simple	+	A*	520	517
changing steady	-	S*	408	666	safe dangerous	-	N*	487	614
TOTAL VARIANCE				6.782	TOTAL VARIANCE				8.266

*Po - Polarity

F - Factor Loading

A - Activity

N - Novelty

P - Potency

S - Stability

[#] Decimal Point Omitted

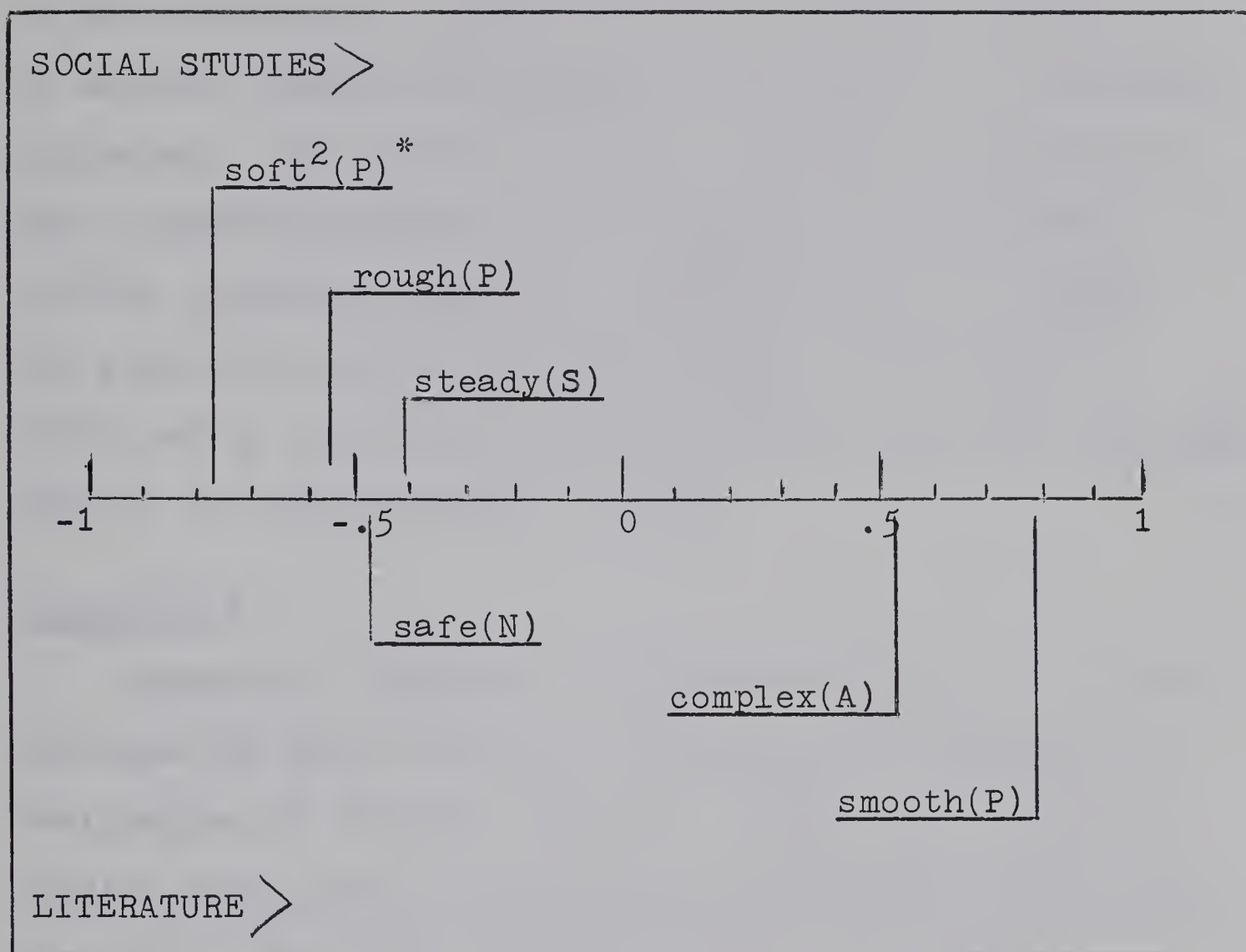


FIGURE 41

FACTOR LOADINGS¹

DIMENSION IV

SOCIAL STUDIES - POTENCY TWO

LITERATURE - SECURITY

- *A - Activity
 N - Novelty
 P - Potency
 S - Stability

¹ Only loadings .400 or higher are diagrammed

² Only one end of the adjective scale is used for simplicity in diagramming

becomes a segmental component of the total pattern determining the necessity or nonnecessity of response. In the literature context the concept of self appears to be measured against the degree of security or "confidence" generated. The presence of this component of meaning in the literature context and its absence in the social studies situation suggests a greater degree of freedom for personal decision in that context. This might be explained by the perception of a less all-powerful external reality in the literature context.

Dimension V

Dimension V exhibits certain similarities in the two contexts but also sufficient differences to warrant the designation of distinct factors. Dimension V in social studies with a sum of squares of .799 accounts for 6.714 percent of the total variance. This is the second Activity (A_2) factor. This dimension in literature is comprised of a Tautness (T) factor with a sum of squares of .890 and accounting for 6.905 percent of the total variance. This dimension is presented in greater detail in Table XXIII and Figure 42.

Activity re-emerges as Factor V in the social studies context this time with the emphasis on "movement" rather than on "speed" as in A_1 . This adds further to the view that the more immediate nature of the world as perceived from the social studies perspective is examined in terms of the need for activity, movement, or response. This

TABLE XXIII

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. V

SOCIAL STUDIES - ACTIVITY TWO					LITERATURE - TAUTNESS				
Adjective Scale	Po*	F*	Load- ing	h^2	Adjective Scale	Po	F	Load- ing	h^2
moving still	-	A*	793 [#]	688 [#]	calm excitable	-	S*	676	579
hot cold	+	A	413	515	hot cold	+	A	658	640
TOTAL VARIANCE				6.714	TOTAL VARIANCE				6.905

*Po - Polarity

F - Factor Loading

A - Activity

S - Stability

[#] Decimal Point Omitted

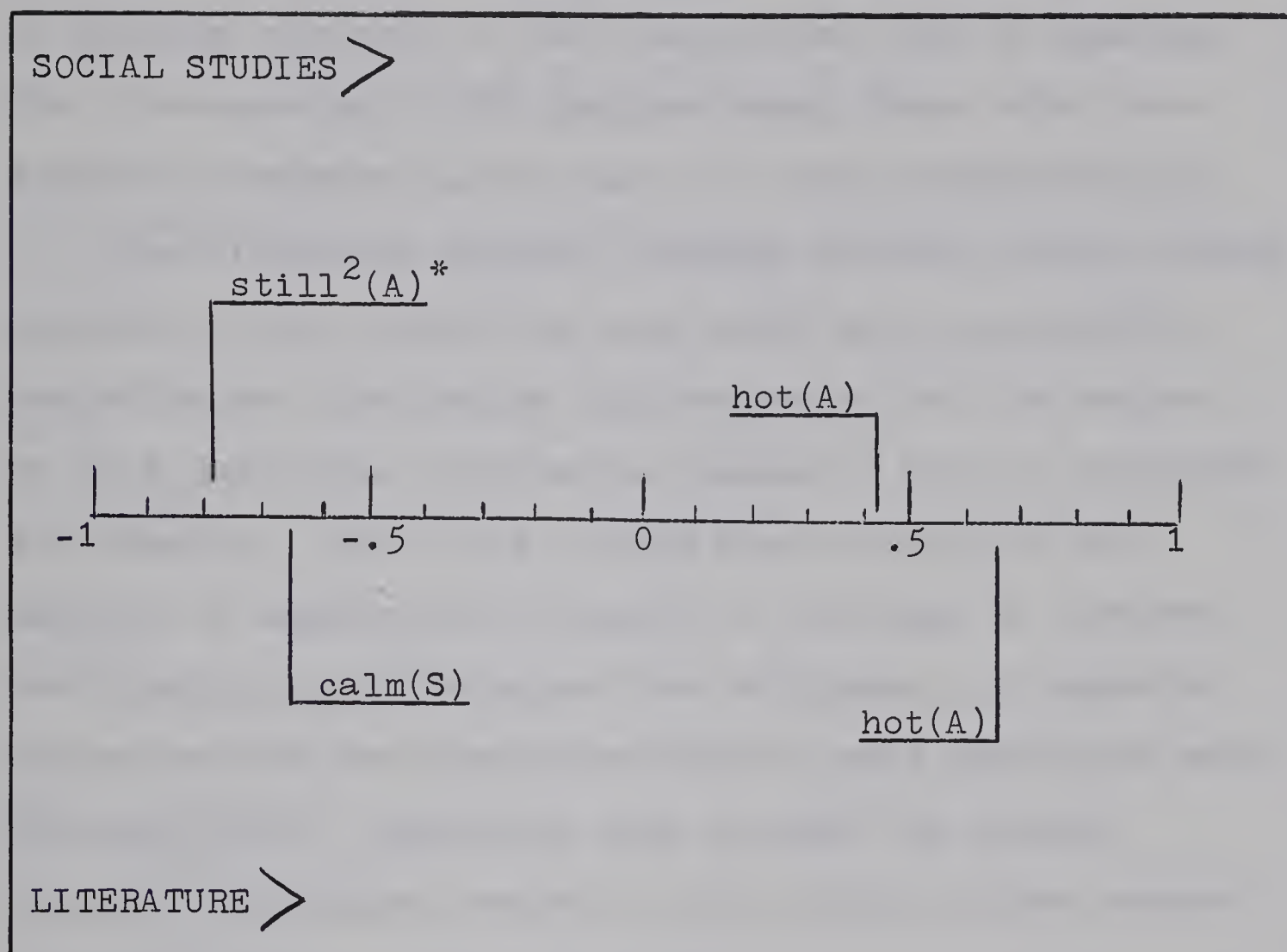


FIGURE 42

FACTOR LOADINGS¹
 DIMENSION V
 SOCIAL STUDIES - ACTIVITY TWO
 LITERATURE - TAUTNESS

*
 A - Activity
 S - Stability

- ¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used
 for simplicity in diagramming

necessity or nonnecessity for movement appears to be controlled as to degree by the potency and other dimensions of meaning intrinsic to this particular view of meaning. The interspersing of (A) factors among these other components of meaning is the basis for this interpretation.

The literature context produces another unique factor, Tautness. This factor has been named with considerable tentativeness considering its narrowness but the scales in this particular combination suggest a kind of alertness and tension. Also, this designation conforms to the pattern of meaning as a function of feelings of movement, familiarity, confidence, and now alertness. It appears therefore that the concept of self is made meaningful more through covert influences than through the largely external influences present in the social studies context.

Dimension VI

Factors in Dimension VI are entirely unlike each other although the social studies factor bears some similarity to Factor IV in literature. Dimension VI in social studies with a sum of squares of .937 accounts for 6.668 percent of the total variance. It has been named a Security (SEC) factor. The literature factor, with a sum of squares of .726 and accounting for 6.837 percent of the total variance is a Potency (P) factor. This dimension is analyzed further in Table XXIV and Figure 43.

A security factor emerging at this point in the social studies context suggests that once the major

TABLE XXIV

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. VI

SOCIAL STUDIES - SECURITY					LITERATURE - POTENCY				
Adjective Scale	Po*	F*	Load- ing	h ²	Adjective Scale	Po	F	Load- ing	h ²
excitable calm	-	S*	698 [#]	558 [#]	large small	+	P	633	491
uncertain certain	-	N*	536	593	clean dirty	-	E*	570	595
rough smooth	+	P*	403	576					
TOTAL VARIANCE			6.668		TOTAL VARIANCE			6.837	

*Po - Polarity

F - Factor Loading

E - Evaluation

N - Novelty

P - Potency

S - Stability

[#] Decimal Point Omitted

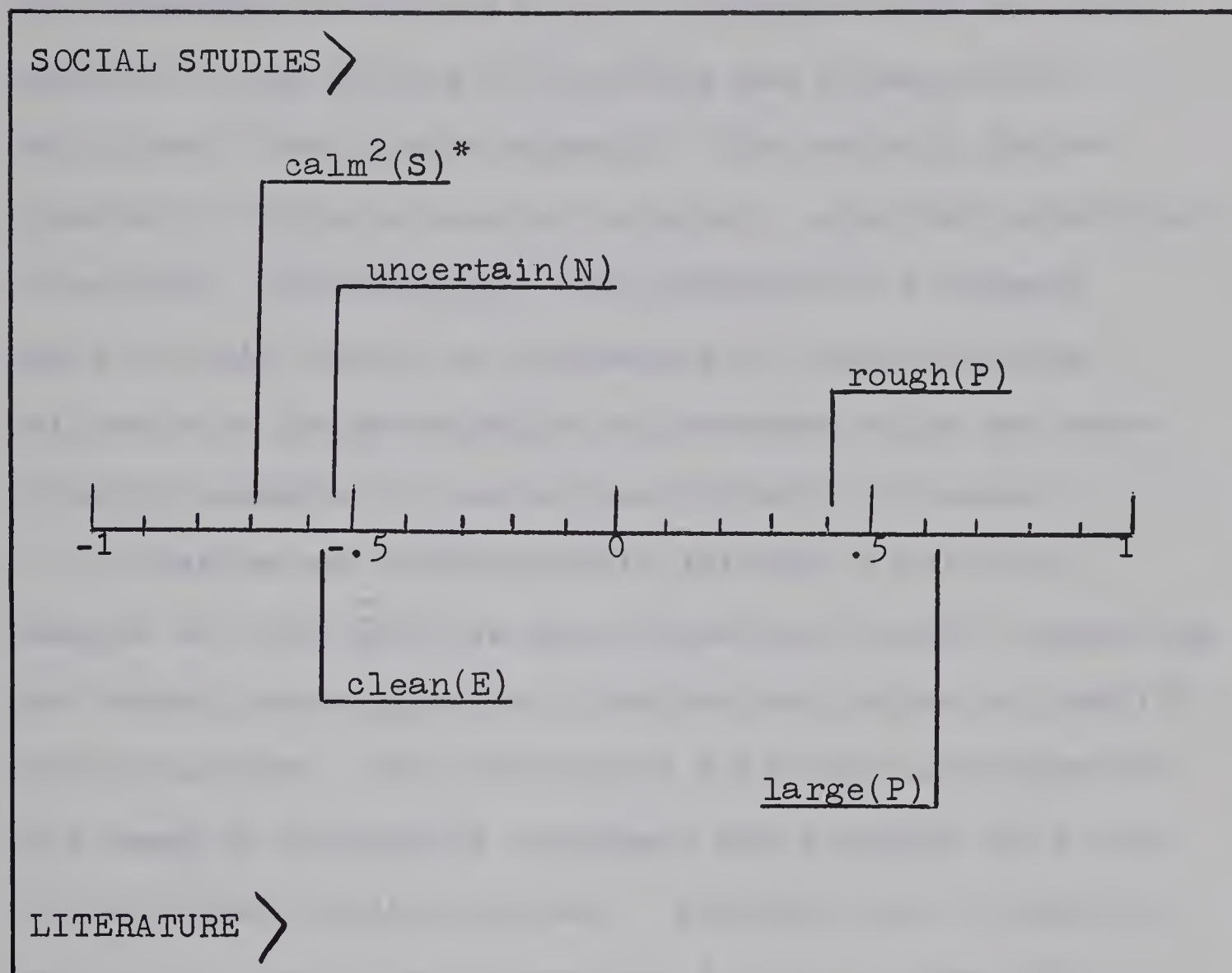


FIGURE 43

FACTOR LOADINGS¹
 DIMENSION VI
 SOCIAL STUDIES - SECURITY
 LITERATURE - POTENCY

- *E - Evaluation
 N - Novelty
 P - Potency
 S - Stability

¹ Only loadings .400 or higher are diagrammed
² Only one end of the adjective scale is used for simplicity in diagramming

dimensions of meaning have been determined by external, environmental characteristics of concepts such as those indexed by the factors of Activity and Potency, the individual turns within himself. The security factor appears to indicate such an internal, psychical determiner of meaning. Nevertheless, the presence of a potency scale in this factor is indicative of the continuing influence of characteristics of concepts which are more directly amenable to perception through the senses.

A narrow and rather poorly defined (P) factor emerges at this point in the literature context suggesting the largely non-objective, intellectual nature of reality in this context. The concept of self does not appear to be viewed as possessing toughness and strength as it is in the social studies context. Perhaps this is due in part to the fact that literature does not demand the individual's active physical participation as does the social studies situation.

Dimension VII

This dimension is present in only the social studies context where, with a sum of squares of 1.039, it accounts for 6.286 percent of total variance. This appears to be a Stability (S) dimension and adds further to the contention that once the external constraints upon meaning in social studies have been brought to bear, the perceiver becomes concerned with characteristics more completely present within his mental "set". Since this factor did

not emerge in the literature context suggests that the quality of stability is of lesser significance there possibly because of the less objective nature of reality. Table XXV and Figure 44 illustrate this dimension.

Table XXVI presents a comparison matrix indicating the degree of congruence between factors in terms of the cosines of the angles between their reference axes. It will be noted that there is a very small amount of similarity between the concept of self in the two contexts. The highest congruence is between factor six in social studies (Security) and factor two in literature (Activity) although the relationship is of an inverse order. Another relatively large degree of agreement is seen between factor two in social studies (Activity One) and factor three in literature (Novelty). Otherwise the degree of congruence goes down to $-.0096$ for factor three in each context indicating generally a very different concept of "yourself" in the two contexts. This is powerfully indicative of differing views of reality.

TABLE XXV

PRINCIPAL AXES ROTATED FACTORS
DIMENSION NO. VII

SOCIAL STUDIES - STABILITY					LITERATURE
Adjective Scale	Po*	F*	Load- ing	h ²	
complex simple	+	S*	781#	682#	NO FACTOR OBTAINED
steady changing	+	S	518	666	
unusual usual	-	N*	401	603	
TOTAL VARIANCE			6.286		

*Po - Polarity

F - Factor Loading

S - Stability

N - Novelty

Decimal Point Omitted

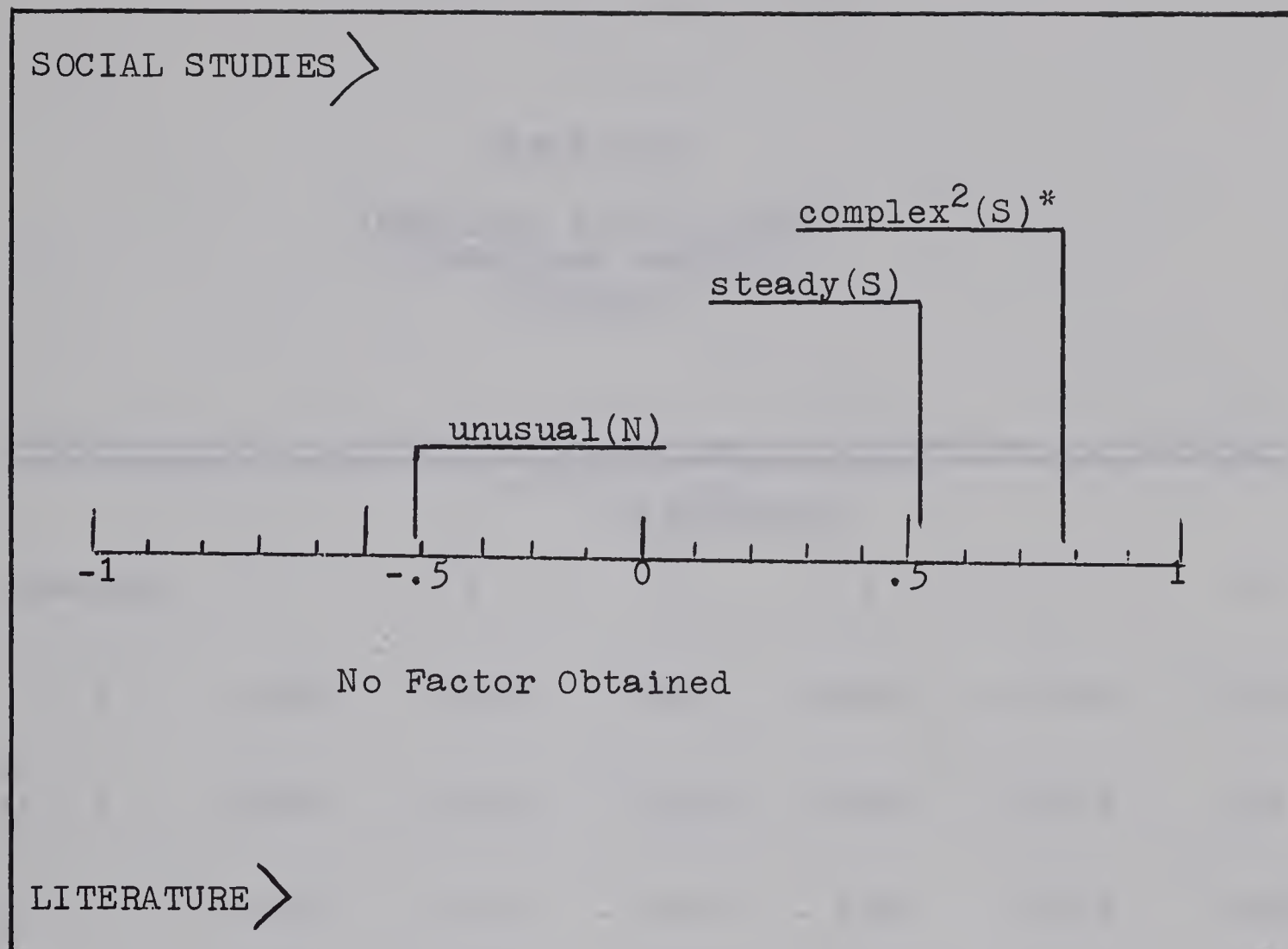


FIGURE 44

FACTOR LOADINGS¹
 DIMENSION VII
 SOCIAL STUDIES - STABILITY

*S - Stability

N - Novelty

¹ Only loadings .400 or higher are diagrammed

² Only one end of the adjective scale is used for simplicity in diagramming

TABLE XXVI

AHMAVAARA FACTOR MATCH
COMPARISON MATRIX L
YOURSELF

		LITERATURE					
Factors	1	2	3	4	5	6	
S O C I A L S T U D I E S	1	-.3902	.0966	.8821	-.2435	-.0191	.0252
	2	-.2684	-.1229	-.2588	.6721	-.1161	.6170
	3	-.3833	-.3055	-.0096	-.1364	-.6145	-.6028
	4	.0203	-.6114	.0741	-.6935	-.0185	.3730
	5	-.4869	-.2124	.0614	-.6187	-.5503	-.1687
	6	.0802	-.9822	.0786	-.0430	.1439	-.0103
	7	.5063	.1084	-.3117	-.0338	-.4314	-.6690

CHAPTER V

SUMMARY AND CONCLUSIONS

I. SUMMARY

Semantic Differential scale factors obtained from the rating by three hundred students of ten concepts in two contexts were the data employed in the comparison of semantic space in an attempt to ascertain the influence of language in the "Weltanschauung" problem.

Two analyses were performed: first a global view of meaning as a function of context where factors were obtained by summing over concepts, and a second analysis based on responses to a single concept. Validity of findings was established by comparison to results obtained for a control group.

Factors isolated and identified for each group were highly consistent with Osgood's three primary dimensions -- Evaluation, Potency, and Activity as well as various secondary factors obtained by Osgood (1957) and Lilly (1965). Secondary factors obtained included: Novelty, Stability, Security, and Tautness. All factors obtained in both analyses having eigenvalues greater than unity were considered to contribute substantially to the dimensionality of meaning space and were therefore examined.

To provide evidence for testing the general hypothesis that the language community characterizing reality within different contexts structures meaning of the same

concepts differentially, the semantic space for each context was compared. Semantic space is assumed to consist of the factor structure generated by analysis of student responses on the SD. The operation of this instrument is predicated upon the view of meaning as a representational mediation process which becomes operative due to the contiguous relationship of symbol and significate. Differences in composition of factors and the overall relationship of factors within the total meaning space were considered indicative of the influence of context upon meaning. Furthermore, these differences were considered to represent different perspectives upon reality as represented by concepts expressed in language. Meaning structures appeared to indicate that concepts differ in two major respects: (1) degree of meaningfulness as expressed by the amount of variance accounted for; (2) quality of meaning as indicated by the composition of factors.

Variations in the amount of total variance accounted for existed between individual factors and also when obtained factors were taken together. Factor loadings also differed between factors in the two contexts. In the global analysis, factors in the social studies context generally accounted for more of the variance indicating a greater meaningfulness of concepts. Certain individual factors in the literature context; eg., Novelty, accounted for more variance than congruent factors in social

studies indicating the greater importance of those factors in that context. Analysis of single concepts showed large variations in meaningfulness of concepts, in some cases favoring the social studies context, in others the literature context. These differences were considered evidence of differential views of reality.

Factor composition varied in terms of width, the number of elements comprising a factor, and the particular elements present in the factor. Factors in both the global and the single concept analysis varied in both of these ways with greater variation found in the latter case. This fact is explained by the tendency of data, when summed and averaged, to regress towards the mean. Width of factor generally favored concepts in the social studies context. The presence of high-loading scales in the factors in one context but not the other appeared to create a semantic space qualitatively different in each case. The social studies factors suggested the greater impact of the objective perceivable characteristics of elements of reality upon meaning, as in Potency and Activity factors. Literature factors suggested the greater importance of subjective, psychical influences upon meaning, as in the Novelty and Security factors.

These differences of internal structure were more apparent within the secondary dimensions suggesting that the dimensions Evaluation, Potency and Activity are fundamental attributes of an individual's orientation

to reality and that other dimensions serve as catalysts for responses which are specific to a given context. These secondary dimensions therefore appear to be critical components of the production of meaning through the representational process and consequently instrumental in triggering a particular kind of fundamental response. It is postulated that these fundamental responses are some variation (through dimensions of necessity and degree) of the basic approach-avoidance reaction.

Finally, the change in semantic space between contexts is both quantitative and qualitative. The meaning of concepts in the two contexts, while generally congruent, is measurably altered suggesting a differential reality in each instance.

II. CONCLUSIONS

The results of any study are limited by the sample of subjects and of the variables used. The present study may be considered representative for upper elementary children from semi-rural school systems similar to that used herein.

The findings are in part dependent upon the selection of adjective scales and concepts used. The variables were selected to facilitate comparisons with other SD studies. Also, by using high frequency words, it was hoped that most of the important dimensions of affective meaning which underlie these words could be discovered.

The results are indicative of a degree of support for

the general hypothesis that meaning takes on differential forms in various contexts indicating varying views of reality. The nature of the factors obtained and the theoretical implications suggest the presence of underlying psychological constructs or "sets" which screen incoming symbolic data to generate specific meaning patterns for concepts. Subsequently these same psychological processes "unwind" to produce appropriate responses to verbal stimuli. These "sets" or patterns are believed to represent differential views of reality as a function of language.

The concept of a psychological set is stated as follows:

For any phenomenon of behavior to appear, it must be assumed that a living being, with the ability of primitive perception and some form of activated need capable of being satisfied in these environmental conditions, develops a relationship with this environment on the basis of the integral state of the set arising in the subject, which leads him to perform purposive actions. (Usnadze, 1966, p. 209).

This view is congruent with Rozeboom's formulations of state and process variables as basic to memory and hence response to meaningful stimuli (Rozeboom, 1965). Rozeboom, like Usnadze, contends that this psychological condition is requisite for the development of psychic phenomena but that it arises out of the individual's presence in a certain "life space". Thus in his lifetime an individual develops many sets or perspectives upon reality (Hertzog, 1967, p. 11).

The motivation to respond as function of meaning determined by psychological set or state is the

Weltanschauung or world view concept in its essential form. This concept defines the scope of the perceiver's focus and therefore the bias, directionality, potency, and locus of the response. Thus because members of the same language community share a common language experience their responses to particular verbal stimuli are similar. The effect of context, therefore, is to modify response hierarchies so that the probabilities of emitting certain responses are either reduced or enhanced (Osgood in Jones, 1957). In effect this results in linguistic differences producing differences in nonlinguistic behavior.

The concept of set or state appears to have a physiological representation. Arnold suggests that emotional tone or psychological state has a filtering or structuring influence upon information (Arnold, 1960). Osgood (in Jones, 1957) expresses a similar position. Using this view, one can conceive that the set, state, or other component of the individual's Weltanschauung acts in the nature of a catalyst which initiates, controls, and integrates behavior but is not itself involved in the psychic processes. Penfield (1959) advances this position in his model of the brain. He states that the brain stem serves as an integrating centre for traveling potentials from various specialized areas in the brain. This is centrencephalic integration and includes signals from the interpretive cortex. The interpretive cortex has in it a mechanism for instant reactivation of the detailed

record of the past. It also has a mechanism for the production of interpretive signals used to scan previous records and select relevant experiences for comparison with present information. Thus occurs the filtering or "coding" of data to organize it into a perception of reality consistent with experience.

Turning to specific conclusions, the results show a high degree of consistency with other studies in respect to the types of factors obtained. Also, factor match coefficients show a generally high level of similarity in both contexts while reliability coefficients were low to moderate in comparison to other studies. This has been interpreted to mean that, in general, the factors obtained measure similar kinds of meaning but that the differences in response from one context to another are reflected in certain rather small shifts in factor structure which are in turn indicative of measurably different structures of semantic space.

With regard to the research hypotheses concerning the differences, the following conclusions have been tentatively drawn:

- (1) Concepts in a social studies context generally show greater intensity of connotative meaning as indicated by the amount of variance accounted for and the magnitude of the loadings.
- (2) The breadth or meaningfulness of concepts as indicated by the number of factors and their width is somewhat

greater in the more objective world of social studies although analysis of individual concepts indicated that this feature of meaning was largely a function of the form class and denotative features of words.

(3) Means of responses on scales did not indicate major shifts in directionality of response as hypothesized. In other words, children tended to rate words towards the same end of the scale in both contexts, the difference being in the intensity of the response (the distance from the neutral position).

(4) Factor structure emerged in two categories: (a) the principal dimensions -- Evaluation, Activity, and Potency, (b) the secondary dimensions -- Novelty, Stability, Security, and Tautness.

With respect to factor structure generally, scales were commonly saturated with more than one factor. Therefore, it was the clustering of the same scales according to a pattern that produced the distinct flavor of the different factors. This was particularly true in the secondary dimensions.

There were some interesting shifts in the overall pattern of factors. The potency factor was displaced from its usual second position in the social studies context (global analysis results) and replaced by an activity dimension. On the other hand there was a potency overtone to all three primary dimensions in social studies. The analysis of the concept "yourself" revealed major shifts

in position for the three principal dimensions.

Secondary dimensions showed greater uniqueness with the novelty factor taking on considerably more importance in the literature context. In the single concept analysis, an entirely different overall pattern of secondary factors emerged generating a structure of meaning emphasizing the feeling of change, familiarity, and intensity rather than that of strength and action as in social studies.

(5) Individual concept factor structure varied considerably more than when responses were summed over concepts. The tendency for individual differences to be camouflaged due to a regression to the mean is an artifact of summation procedures. Thus the relatively minor differences of the global analysis must be considered in this light.

These results have implications for instruction. Since the connotative meaning of concepts appears to vary with the context suggesting a differential perception of reality, educators must be aware of the nature of the "set" created. If the individual's world view screens, or codes environmental stimuli in terms of the meaning language symbols hold, then conscious effort must be made to either enrich those perceptions which are veridical to empirical and social reality or present evidence to alter inaccurately structured concepts.

Also the specific nature of semantic space in different contexts should provide clues as to the instructional materials and procedures most appropriate for

that setting. For example, if from a social studies view concepts are more varied in meaning through a differential application of the dimensions of Potency and Activity, then materials and procedure designed to present these characteristics of concepts should be employed. If the secondary dimensions identified in this study serve as catalysts to activate the fundamental attributes of human behavior represented by the principal dimensions, careful attention must be given to the development of these internal states for without them meaning in its fulness may not be released. Finally, the fact that meaning is shared less or is more idiosyncratic in certain contexts should cause teachers to plan for development of concepts along personal lines without emphasizing a particular "correctness".

The limitations of this study should be noted again in that they may restrict the applicability of the findings of the study. With respect to methodology, the Semantic Differential has certain shortcomings as a measuring instrument for indicating degree of change. Also, there are no tests of statistical significance of factors. These limitations result in a greater degree of subjectivity than might be desirable in an empirical study. Nonetheless, the SD is the most sophisticated and reliable instrument of this kind available. Consequently, while its deficiencies must be acknowledged, it should be considered suitable for the task.

In regard to the SD, it should be noted that there is little information available as to the scale properties of

this instrument for children. Assumptions underlying the antonymic qualities of scales and related scaling problems should be investigated with child subjects as they have been for adults. Developmental studies (Lilly, 1965) showed that children as young as grade three possessed the same major factors of affective meaning suggesting that all upper elementary children can use this instrument reliably.

Only two of the several subject areas in the elementary school were selected to serve as contexts for measuring meaning. This provides a limited view of meaning so that it is not possible to determine whether there are broader patterns of meaning for words or whether each discipline or subject area generates its own.

Similarly, the limited sample of concepts and scales can do no more than report the general nature of meaning change due to context. A more complete sample of each would provide detailed evidence of such change.

The use of a sample of children within a particular age group limits the applicability of these findings to children of other ages in the elementary school. Also it is not possible to determine the stages of development of affective meaning in elementary school children. The developmental features of meaning should therefore be investigated.

The selection of the experimental sample from one geographic area further limits the applicability of these findings. It is possible that cultural influences present in other areas of residence may generate still

different versions of reality as measured by word meaning.

III. SUGGESTIONS FOR FURTHER RESEARCH

Since the Weltanschauung problem remains to be more adequately resolved further research should continue to investigate this area of language and reality. A few of the possibilities include:

1. A replication of this study using other contexts.
2. A replication of this experiment using a different sample of scales.
3. A developmental study employing similar procedures.
4. A study designed to determine whether linguistic differences necessarily eventuate in differences in nonlinguistic behavior.
5. A replication of this study including other measures of meaning such as the word association technique and measures of denotative or referential meaning.
6. A study concerned with determining the effectiveness of practical applications of these findings in curriculum and instruction.
7. A replication of this study using sex and SES as independent variables.
8. A replication of this study using adult individuals in the various disciplines in order to identify baseline sets or states defining the world view from those perspectives.

9. A study designed to investigate the nature of linguistic context within different disciplines of fields of academic activity to determine what syntactic structures are commonly employed.

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APPENDIX A

SEMANTIC DIFFERENTIAL SCALES
SOCIAL STUDIES WORD MEANING TEST
READING WORD MEANING TEST

Note: Only one sample page from each test form,
which consisted of ten pages, is included.

SOCIAL STUDIES

WORD MEANING TEST

Identification Form

NAME _____,

Last

First

Boy _____

Girl _____

(check ✓)

Town Student _____

Country Student _____ (check ✓)

Age _____

Grade _____

School _____

Teacher _____

Date _____, 196 ____.

SOCIAL STUDIES
WORD MEANING TEST

In the lowlands there is fertile farm land.

Land

SOCIAL STUDIES WORD MEANINGS

229

1.	clean	:	:	:	:	:	:	dirty
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
2.	painful	:	:	:	:	:	:	pleasurable
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
3.	soft	:	:	:	:	:	:	hard
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
4.	light	:	:	:	:	:	:	heavy
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
5.	rough	:	:	:	:	:	:	smooth
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
6.	moving	:	:	:	:	:	:	still
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
7.	strong	:	:	:	:	:	:	weak
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
8.	fast	:	:	:	:	:	:	slow
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
9.	important	:	:	:	:	:	:	not important
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
10.	kind	:	:	:	:	:	:	cruel
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
11.	excitable	:	:	:	:	:	:	calm
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
12.	large	:	:	:	:	:	:	small
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
13.	dangerous	:	:	:	:	:	:	safe
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
14.	bad	:	:	:	:	:	:	good
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
15.	steady	:	:	:	:	:	:	changing
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
16.	unusual	:	:	:	:	:	:	usual
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
17.	ugly	:	:	:	:	:	:	beautiful
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
18.	hot	:	:	:	:	:	:	cold
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
19.	complex	:	:	:	:	:	:	simple
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
20.	uncertain	:	:	:	:	:	:	certain
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3

Indicate answer by placing a mark between the guidelines as shown in the example. Use HB pencil. Don't make marks longer than guidelines.

Example

100	100	100	100	100
100	100	100	100	100

TEST

I. D. NUMBER

[illegible]

3	2	1	0	1	2	3	1	3	2	1	0	1	2	3
3	2	1	0	1	2	3	2	3	2	1	0	1	2	3
3	2	1	0	1	2	3	3	3	2	1	0	1	2	3
3	2	1	0	1	2	3	4	3	2	1	0	1	2	3
3	2	1	0	1	2	3	5	3	2	1	0	1	2	3
3	2	1	0	1	2	3	6	3	2	1	0	1	2	3
3	2	1	0	1	2	3	7	3	2	1	0	1	2	3
3	2	1	0	1	2	3	8	3	2	1	0	1	2	3
3	2	1	0	1	2	3	9	3	2	1	0	1	2	3
3	2	1	0	1	2	3	10	3	2	1	0	1	2	3
4	2	1	0	1	2	3	11	3	2	1	0	1	2	3
5	2	1	0	1	2	3	12	3	2	1	0	1	2	3
6	2	1	0	1	2	3	13	3	2	1	0	1	2	3
7	2	1	0	1	2	3	14	3	2	1	0	1	2	3
8	2	1	0	1	2	3	15	3	2	1	0	1	2	3
9	2	1	0	1	2	3	16	3	2	1	0	1	2	3
10	2	1	0	1	2	3	17	3	2	1	0	1	2	3
11	2	1	0	1	2	3	18	3	2	1	0	1	2	3
12	2	1	0	1	2	3	19	3	2	1	0	1	2	3
13	2	1	0	1	2	3	20	3	2	1	0	1	2	3

1	2	3	0	1	2	3	1	2	3
2	2	1	0	1	2	3	2	2	3
3	2	1	0	1	2	3	3	2	3
4	2	1	0	1	2	3	4	3	2
5	2	1	0	1	2	3	5	3	3
6	2	1	0	1	2	3	6	3	3
7	2	1	0	1	2	3	7	3	3
8	2	1	0	1	2	3	8	3	3
9	2	1	0	1	2	3	9	3	3
10	2	1	0	1	2	3	10	3	3
11	2	1	0	1	2	3	11	3	3
12	2	1	0	1	2	3	12	3	3
13	2	1	0	1	2	3	13	3	3
14	2	1	0	1	2	3	14	3	3
15	2	1	0	1	2	3	15	3	3
16	2	1	0	1	2	3	16	3	3
17	2	1	0	1	2	3	17	3	3
18	2	1	0	1	2	3	18	3	3
19	2	1	0	1	2	3	19	3	3
20	2	1	0	1	2	3	20	3	3

READING

WORD MEANING TEST

Identification Form

NAME _____, _____
Last First

Boy _____ Girl _____ (check ✓)

Town Student _____ Country Student _____ (check ✓)

Age _____

Grade _____

School _____

Teacher _____

Date _____, 19 ____.

READING
WORD MEANING TEST

New settlers moved in and cleared the land.

land

1.	clean	:	:	:	:	:	:	dirty
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
2.	painful	:	:	:	:	:	:	pleasurable
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
3.	soft	:	:	:	:	:	:	hard
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
4.	light	:	:	:	:	:	:	heavy
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
5.	rough	:	:	:	:	:	:	smooth
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
6.	moving	:	:	:	:	:	:	still
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
7.	strong	:	:	:	:	:	:	weak
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
8.	fast	:	:	:	:	:	:	slow
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
9.	important	:	:	:	:	:	:	not important
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
10.	kind	:	:	:	:	:	:	cruel
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
11.	excitable	:	:	:	:	:	:	calm
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
12.	large	:	:	:	:	:	:	small
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
13.	dangerous	:	:	:	:	:	:	safe
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
14.	bad	:	:	:	:	:	:	good
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
15.	steady	:	:	:	:	:	:	changing
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
16.	unusual	:	:	:	:	:	:	usual
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
17.	ugly	:	:	:	:	:	:	beautiful
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3
18.	hot	:	:	:	:	:	:	cold
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
19.	complex	:	:	:	:	:	:	simple
	+3	:	+2	:	+1	:	0	-1
		:		:		:	-2	-3
20.	uncertain	:	:	:	:	:	:	certain
	-3	:	-2	:	-1	:	0	+1
		:		:		:	+2	+3

NAME

Last

First

Middle

SCHOOL

AGE

Years

GRADE

BOY

GIRL

DATE

Day

Month

Year

TEST

233

I. D. NUMBER

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

2

3

4

5

6

7

8

9

0

1

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3

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6

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9

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7

8

9

Example

0

1

2

3

4

5

6

7

8

9

3	2	1	0	1	2	3	1	3	2	1	0	1	2	3
3	2	1	0	1	2	3	2	3	2	1	0	1	2	3
3	2	1	0	1	2	3	3	3	2	1	0	1	2	3
3	2	1	0	1	2	3	4	3	2	1	0	1	2	3
3	2	1	0	1	2	3	5	3	2	1	0	1	2	3
3	2	1	0	1	2	3	6	3	2	1	0	1	2	3
3	2	1	0	1	2	3	7	3	2	1	0	1	2	3
3	2	1	0	1	2	3	8	3	2	1	0	1	2	3
3	2	1	0	1	2	3	9	3	2	1	0	1	2	3
3	2	1	0	1	2	3	10	3	2	1	0	1	2	3
3	2	1	0	1	2	3	11	3	2	1	0	1	2	3
3	2	1	0	1	2	3	12	3	2	1	0	1	2	3
3	2	1	0	1	2	3	13	3	2	1	0	1	2	3
3	2	1	0	1	2	3	14	3	2	1	0	1	2	3
3	2	1	0	1	2	3	15	3	2	1	0	1	2	3
3	2	1	0	1	2	3	16	3	2	1	0	1	2	3
3	2	1	0	1	2	3	17	3	2	1	0	1	2	3
3	2	1	0	1	2	3	18	3	2	1	0	1	2	3
3	2	1	0	1	2	3	19	3	2	1	0	1	2	3
3	2	1	0	1	2	3	20	3	2	1	0	1	2	3
3	2	1	0	1	2	3	1	3	2	1	0	1	2	3
3	2	1	0	1	2	3	2	3	2	1	0	1	2	3
3	2	1	0	1	2	3	3	3	2	1	0	1	2	3
3	2	1	0	1	2	3	4	3	2	1	0	1	2	3
3	2	1	0	1	2	3	5	3	2	1	0	1	2	3
3	2	1	0	1	2	3	6	3	2	1	0	1	2	3
3	2	1	0	1	2	3	7	3	2	1	0	1	2	3
3	2	1	0	1	2	3	8	3	2	1	0	1	2	3
3	2	1	0	1	2	3	9	3	2	1	0	1	2	3
3	2	1	0	1	2	3	10	3	2	1	0	1	2	3
3	2	1	0	1	2	3	11	3	2	1	0	1	2	3
3	2	1	0	1	2	3	12	3	2	1	0	1	2	3
3	2	1	0	1	2	3	13	3	2	1	0	1	2	3
3	2	1	0	1	2	3	14	3	2	1	0	1	2	3
3	2	1	0	1	2	3	15	3	2	1	0	1	2	3
3	2	1	0	1	2	3	16	3	2	1	0	1	2	3
3	2	1	0	1	2	3	17	3	2	1	0	1	2	3
3	2	1	0	1	2	3	18	3	2	1	0	1	2	3
3	2	1	0	1	2	3	19	3	2	1	0	1	2	3
3	2	1	0	1	2	3	20	3	2	1	0	1	2	3

APPENDIX B

SENTENCES USED TO INTRODUCE CONCEPTS

I. SOCIAL STUDIES SENTENCES

II. LITERATURE SENTENCES

I. SOCIAL STUDIES SENTENCES

Great Men of Medicine - Hume

Vesalius was young for such an honor, the University faculty realized. (p. 15)

Had he used the wrong kind on the squirrels and rabbits? (p. 72)

A Geography of Canada - Dent & Sons

In the lowlands there is fertile farm land. (p. 11)

When they are gone, other sources of power will have to be found to add to the water power that is now being produced. (p. 17)

When people are prosperous, they spend some of their money in other countries. (p. 21)

The information accumulated at these stations permits the government to impose regulations to control the number of fish caught. (p. 332)

Notable buildings include Memorial University, erected in 1924 in honor of those who served in the First World War. (p. 167)

Magnificent Dufferin Terrace, near the Citadel, said to command the finest view on the continent, overlooks Lower Town. (p. 165)

Land, Water and People - Braithwaite

The story of this book will be the story of the land, the water and the people of Canada. (p. 7)

The rich coal fields of Cape Breton provided a ready source of power for manufacturing. (p. 48)

Even if the people just seek shelter under trees, bathe in the rivers or use sharp stones to kill animals for food, they are using natural resources. (p. 251)

Such ports as Churchill, Chesterfield Inlet, and even Pond Inlet and Arctic Bay have been regular ports of call for Government and Hudson's Bay Company ships. (p. 232)

Here men and women who have money to invest bid for the mining stock just as farmers bid for livestock at a rural auction sale. (p. 234)

The Great Adventure - Dickie

Pontgrave commanded the second ship, and Champlain acted as "geographer". (p. 51)

At last Nicholas admitted that he had been wrong. (p. 61)

When the mother countries made peace in the Treaty of Utrecht, in 1713, France gave up to England all her claims to Acadia, Newfoundland and Hudson Bay. (p. 135)

General Braddock himself was killed. (p. 145)

They made Britain promise to pay a very large sum for the wrong done by the raiders. (p. 445)

Montcalm had been a soldier from boyhood, had won honor in two wars, and had married Talon's grand-niece. (p. 147)

France sent word that she was now at peace with Britain and that they must bury the hatchet. (p. 157)

A New Geography of Canada - Gage

These are large grants of land made by the French king to men called seigneurs. (p. 137)

A large industrial city like Montreal requires vast quantities of power and energy. (p. 157)

One of the best known of these was that of James McGill who gave the money and land to begin McGill University. (p. 149)

Therefore, it is of interest to Canada to promote world peace. (p. 484)

In some cases, great enterprises have been undertaken by the government because no other Canadian source of capital has been available. (p. 484)

Explorers All - Anthony & Barnes

Marco commanded a fleet. (p. 16)

In a scuffle between his men and the natives, Cook was killed. (p. 82)

Like so many famous men, he received most of his honor after his death. (p. 24)

The Vikings - Rich

First of all, they gained their power by having a better army and navy than anyone else did. (p. 61)

II. LITERATURE SENTENCES

Young Canada Readers - Nelson

Just don't get yourself all worked up. (p. 75)

Never forget, however, about the bell, for if you touch it and give the wrong reply to the waking warriors, woe betide you. (p. 81)

She then took the kettle and poured into each jar, from the first to the last, enough boiling oil to kill the robbers. (p. 232)

I am a man of peace. (p. 255)

So, as the King commanded, Daedalus designed the Labyrinth. (p. 263)

"King Minos may shut my way out by land and by sea," he thought, "but he does not control the air." (p. 264)

When it is grown, we could not claim its lambs with honor. (p. 276)

But money can't help us. (p. 114)

Take this magic flower, keep it with you, and Circe's magic will have no power against you. (p. 428)

Canadian Heritage Reader - Johnson

"And we'll give the money back," said the second robber.
(p. 167)

Just read it yourself. (p. 172)

He said that Sweden and Sweden's people were blessed with work, and blessed with peace. (p. 270)

He spoke of the fine men who were working for the good of their land. (p. 270)

It was an honor to help raise the Maypole on Midsummer Night. (p. 270)

Off you go at once, and if you don't bring me back some violets I will kill you. (p. 351)

He also wanted a change of king and government, and he knew all about setting fuses and digging tunnels. (p. 375)

"Something must be wrong," said Donald. (p. 382)

Trails to Treasure - Russell

That's your share of the dance-music money. (p. 68)

Outside, the forest was at peace again, beautiful beside the waters of Erie. (p. 85)

He considered it a sin to kill or to harm any of them.
(p. 94)

New settlers moved in and cleared the land. (p. 96)

At last Gessler commanded that Tell be unbound in order that he might handle the boat, since he was the most skillful boatman in Switzerland. (p. 334)

There he commanded him to swear on his honor that he had pulled the sword from the stone. (p. 323)

He could have given it back to the government and asked for a more fertile piece of land somewhere else, and it would have been given to him. (p. 346)

Whirlpools and currents steadily tugged and poked the bow, so that half the time he seemed to be rowing in the wrong direction. (p. 413)

Men who repair electric power lines know that stormy weather usually brings hard work for them. (p. 415)

Perhaps you'd like to help yourselves to an apple apiece before you leave. (p. 278)

Wide Open Windows - Barrett

In this way the Government hoped to keep the reindeer in the hands of the Eskimos. (p. 261)

He had been waiting eagerly for his grandfather to command him. (p. 249)

It is so beautiful; it is far beyond my power to play it well. (p. 316)

APPENDIX C

TEST PROTOCOL FOR TEACHERS

TEACHER'S CHECKLIST FOR ADMINISTRATION OF
THE WORD MEANING TESTS

I. UPON RECEIPT OF TESTS & INSTRUCTIONS

- ☐ Skim tests and instructions to determine nature of the tests and the general test procedures.
- ☐ Read "Directions For Teachers" and "Directions for Pupils" carefully, noting points at which your particular class may require special assistance in the interpretation of these instructions.
- ☐ If clarification of any part of the procedure is required, phone P. Evanechko, Leduc, 446-3369. COLLECT.

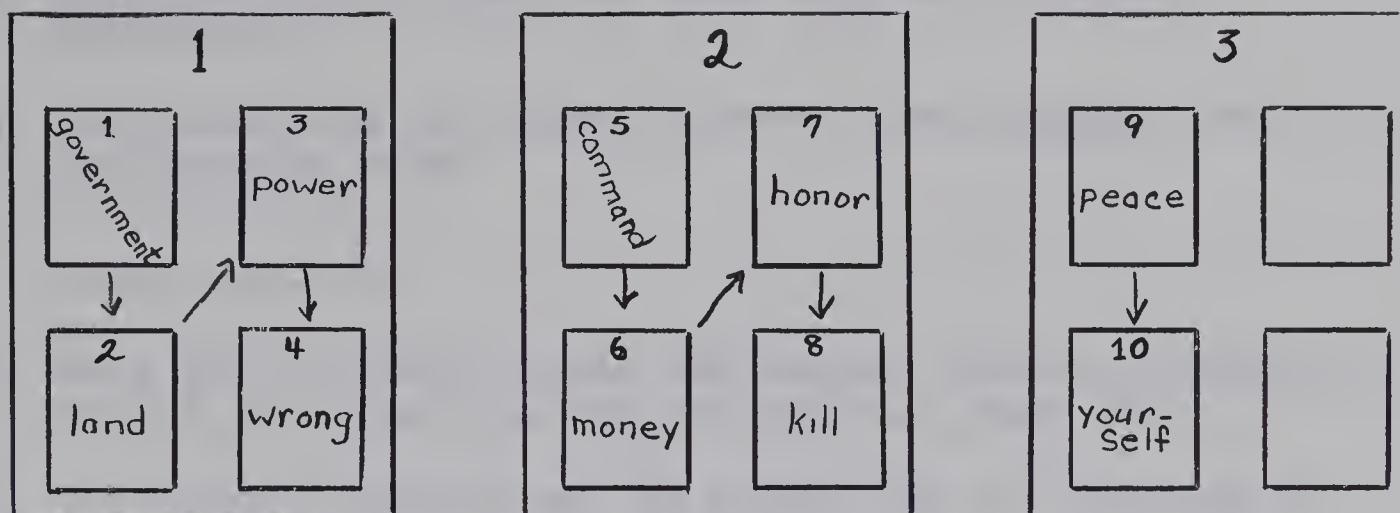
II. THE DAY AFTER RECEIPT OF TESTS

- ☐ At the conclusion of the regular social studies (enterprise) or reading period (depending on the form of the test to be administered) inform the class of the test. Indicate as strongly as possible that it is a word meaning test in social studies or in reading.
- ☐ Indicate to the children that they will not be able to prepare for the test but will simply have to draw on their experience.
- ☐ Distribute the instruction booklets for the test and review carefully the procedures for test administration (Part II Section A of the "Directions For Teachers".)
- ☐ Collect instruction booklets.

III. THE DAY OF THE TEST

- ☐ At the beginning of the test period, which must coincide with the regular reading or social studies period, review directions for test administration considered the previous day.
- ☐ Have children fill out identification form and put their name and name of the test on each answer sheet.
- ☐ Discuss and explain the use of the answer sheets giving particular attention to the following:
 1. Order of responses on sheets. Draw the following diagram on the blackboard and explain

the procedure so that all children follow the same sequence in making their responses.



2. Order of use of sheets.
Indicate that sheets have been numbered 1, 2, 3 and must be used in that fashion. (Refer to above diagram.)
3. Marking of responses.
Remind the children to disregard the space between 1 and 2 on the right side of the zero. See that all children use an HB pencil and mark the spaces exactly as indicated, in the example at the top of the sheet.
4. Care of answer sheets.
Remind children not to mutilate the sheets or make any stray pencil marks on them.

- ☐ Urge the children to work quickly, putting down their first impressions.
- ☐ Urge the children to respond to every word showing what it means to them.

IV. DURING THE TEST

- ☐ Move from child to child to check that:
 1. children do not turn back to the sentences.
 2. children fill in a space on the answer sheets immediately after responding on the question sheets.
 3. responses on the answer sheet are in the same place as on the question sheet.
 4. the responses are being made in the proper sequence (see diagram).

5. the sheets are being used in the proper sequence.

- ☐ HELP THE CHILD READ ANY WORD WITH WHICH HE IS UNFAMILIAR.
- ☐ Encourage the children to move along quickly but at a comfortable pace.

V. AFTER THE TEST

- ☐ Have the children place the answer sheets in order on top of the question sheets and turn them in.
- ☐ Direction booklets may be turned in or retained by the children at your discretion.
- ☐ If other arrangements have not been made, phone the investigator COLLECT (Leduc 446-3369) to indicate that the data is ready for pickup.

TO THE TEACHER:Part IPurpose of the Study

The major purpose of this study is to determine whether there is a change in affective meaning of words and concepts from one subject area context to another. Affective or connotative meaning underlies the denotative meaning attached to concepts in language and therefore structures the individual's perceptions of the referents of these concepts. The "world view" of human beings can thus be said to be in part a function of their language. This study will, therefore, attempt to discern whether the context within which words and concepts are used produces differences in the connotative meaning of words and concepts and the nature of these differences. If there are meaning differences, when these are quantified and placed into comprehensible structures, teachers will be able to organize learning situations in the knowledge of the unique meanings of concepts in specific contexts.

Procedure

To measure and quantify the connotative meaning of the selected concepts this study will use the Semantic Differential. This is an instrument employing a series of bipolar adjectives and requiring the subject to make a forced choice in describing the concepts being examined. These choices, when factored, map out the position which each concept occupies in the individual's, or group's, semantic space.

Since the determining factor in this study will be the "context" within which the concept is used, it is vital to insure that this context exists in as natural and complete a manner as that found in everyday classroom situations. Therefore the two tests, reading and social studies, must be introduced as regular tests and administered during the regularly scheduled reading and social studies periods. In order to make the test situation as normal as possible, the teacher is asked to go about the administration of the test in the usual manner, emphasizing that the test is part of on-going classroom activities. Each class will do both tests. Test administration will be separated by a period of two weeks.

Part II

Introduction

Teachers are asked to do section A in Part II of these directions twice. The first time should be at the end of a [reading, social studies] period the day before the administration of the test. At this time only the Direction booklet should be given to the children who should put their names on it to identify it later. The second time will be on the day of administration of the test when section B will also be read and the children will have their question booklets before them.

This process should familiarize the children with the marking procedures and will save time on the day of administration. It will not be necessary to repeat this procedure when the second form of the test is being administered i.e. the directions may be read only once.

3.

Section A

Read the enclosed directions to the students, pausing to answer questions which may arise. Allow the students to work through the sample scales provided at the end of the direction booklet. Check the students' responses to make sure they understand the bipolar nature of the adjectives, i.e. that they are opposites, that they are aware that the direction of the scales may be reversed from item to item, and that the check-mark is to be placed on the line above one of the numbers. Also remind students to respond only once to any item and to respond on all scales.

Section B

When the sample scales have been completed read the following directions to the Class:

"Now we are ready to begin the test. Open your test booklet to the first page of scales. (Check to see that all students comply correctly.) You will notice that this is a word meaning test for [reading - social studies] (insert appropriate designation). You will also notice that the word you are to describe is used in a sentence in a way similar to its use in your [readers - social studies references] (insert words). Read the first sentence to yourself. (Pause while students read the sentence attached to the top of the first scale sheet.) Notice that the word to be described has been placed in a box. It is also printed at the top of each sheet. In doing the test you are to first read the sentence carefully, then turn the slip with the sentence over, and finally, keeping

4.

the word which is printed at the top of the page in mind, describe it on the scales. Do not turn back to the sentence once you have begun describing the word since you are to describe the word not the sentence. Be careful to mark the answer sheets exactly as indicated in the directions.

Remember, this is a test of word meanings as generally used in your [readers - social studies references] (insert appropriate words) so we want your first feelings about each word.

You may begin. You will have as much time as you need."

APPENDIX D

DIRECTIONS TO STUDENTS

DIRECTIONS FOR THE SOCIAL STUDIES WORD MEANING TEST

TO THE STUDENTS:

The purpose of this test is to measure the meanings of certain words used in your social studies. These words will have different meanings for different students. In this test, please make your judgements on the basis of what these words mean to you. On each page of this test you will find a different social studies word to be described and beneath it a set of scales. You are to describe the social studies word on each of the scales in order.

Here is how you are to use these scales: If you feel that the social studies word at the top of the page is very closely related to or belongs to one end of the scale, you should place your check-mark as follows:

fair							unfair
<u> X </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
+3	+2	+1	0	-1	-2	-3	

or

fair							unfair
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> X </u>
+3	+2	+1	0	-1	-2	-3	

If you feel that the social studies word is quite closely related to one or the other end of the scale (but not very much related), you should place your check - mark as follows:

weak						strong
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
-3	X -2	-1	0	+1	+2	+3

or

weak						strong
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
-3	-2	-1	0	+1	X +2	+3

If the social studies word seems only slightly related to one side as compared to the other (but is not the middle point) then you should check as follows:

bad						good
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
-3	-2	-1	0	X +1	+2	+3

or

bad						good
<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
-3	-2	X -1	0	+1	+2	+3

The direction toward which you check depends upon which of the two ends of the scale best describe this social studies word. You will notice that the scales change direction every so often so that the end of the scale with the + numbers is on one side at one time and the other side another time. You must watch for this change.

If you consider the reading word to be neutral, both sides of the scale being just as closely related to the word, or if the scale doesn't have any meaning for the word, is not related to it, then you should place your check-mark in the middle space:

Page 1

Date

Time

1.00

1.00

1.00

1.00

1.00

1.00

The first part of the report is a summary of the work done during the last year.

The second part is a detailed account of the work done during the last year.

The third part is a list of the references used.

1.00

1.00

1.00

1.00

1.00

1.00

1.00

1.00

1.00

1.00

1.00

1.00

The fourth part is a list of the references used.

The fifth part is a list of the references used.

The sixth part is a list of the references used.

The seventh part is a list of the references used.

The eighth part is a list of the references used.

The ninth part is a list of the references used.

The tenth part is a list of the references used.

The eleventh part is a list of the references used.

The twelfth part is a list of the references used.

- 3 -

safe						dangerous
+3	+2	+1	0	-1	-2	-3

Important: (1) Place your check-marks in the middle of spaces, not on the boundaries:

			this	not this	
+3	+2	+1	X 0	-1 :X	-2 -3

(2) Be sure you check every scale for every social studies word - do not omit any.

(3) Never put more than one check-mark on a single scale.

Sometimes you may feel as though you've had the same item before on the test. This will not be the case, so do not look back and forth through the items. Do not try to remember how you checked similar words earlier in the test. Make each word a separate test. Work as quickly as you can. Do not worry over single scales. We want your "first ideas or feelings" about these social studies words. Please do not be careless because we want your true feelings.

If you have any questions ask them now.

The following examples are for you to practice on. Your teacher will check to see that you are proceeding correctly. The "key word" is SUN.

- 4 -

SUN

bad						good
<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °
+3	+2	+1	0	-1	-2	-3

hot						cold
<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °
+3	+2	+1	0	-1	-2	-3

far						near
<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °
-3	-2	-1	0	+1	+2	+3

small						large
<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °	<u> </u> °
-3	-2	-1	0	+1	+2	+3

You will notice that 3 special answer sheets have been given to you. Please use them in this way: When you have placed a check-mark on the right space on the question sheet go directly to the answer sheet and fill in the same space there. Be sure that you fill in the space that has the same number as the one on the question sheet and is on the same side of the "o" as in the question sheet. Make sure you do the scales one by one and that you fill in the spaces according to the directions at the top of the sheet.

You will notice a space between numbers 1 and 2 on the right side of the zero. Just pretend that space is not there. When you have finished the twenty scales for one word, go to the twenty scales below for the next word and then over to the top of the sheet and so on. Use the sheets as numbered.
PLEASE DO NOT BEND OR TEAR THESE SHEETS.

Fill in only your name and the name of the test at the top of each answer sheet.

DIRECTIONS FOR THE READING WORD MEANING TEST

TO THE STUDENTS:

The purpose of this test is to measure the meanings of certain words used in your readers. These words will have different meanings for different students. In this test, please make your judgements on the basis of what these words mean to you. On each page of this test you will find a different reading word to be described and beneath it a set of scales. You are to describe the reading word on each of the scales in order.

Here is how you are to use these scales: If you feel that the reading word at the top of the page is very closely related to or belongs at one end of the scale, you should place your check-mark as follows:

fair				unfair		
X						
+	+	+	0	-	-	-
3	2	1		1	2	3

fair				unfair		
						X
+	+	+	0	-	-	-
3	2	1		1	2	3

If you feel that the reading word is quite closely related to one or the other end of the scale (but not very much related), you should place your check-mark as follows:

weak			strong			
_____:	<u> X </u> :	_____:	_____:	_____:	_____:	_____:
-3	-2	-1	0	+1	+2	+3

or

weak			strong			
_____:	_____:	_____:	_____:	_____:	<u> X </u> :	_____:
-3	-2	-1	0	+1	+2	+3

If the reading word seems only slightly related to one side as compared to the other (but is not the middle point), then you should check as follows:

bad			good			
_____:	_____:	_____:	_____:	<u> X </u> :	_____:	_____:
-3	-2	-1	0	+1	+2	+3

or

bad			good			
_____:	_____:	<u> X </u> :	_____:	_____:	_____:	_____:
-3	-2	-1	0	+1	+2	+3

The direction toward which you check depends upon which of the two ends of the scale best describe this reading word. You will notice that the scales change direction every so often so that the end of the scale with the + numbers is on one side at one time and the other side another time. You must watch for this change.

If you consider the reading word to be neutral, both sides of the scale being just as closely related to the word, or if the scale doesn't have any meaning for the word, is not related to it, then you should place your check-mark in the middle space:

safe				dangerous		
_____:	_____:	_____:	X _____:	_____:	_____:	_____:
+3	+2	+1	0	-1	-2	-3

Important: (1) Place your check-marks in the middle of spaces, not on the boundries:

this				not this		
_____:	_____:	_____:	X _____:	_____:	_____:	_____:
+3	+2	+1	0	-1	-2	-3

- (2) Be sure you check every scale for every reading word - do not omit any.
- (3) Never put more than one check-mark on a single scale.

Sometime you may feel as though you've had the same item before on the test. This will not be the case, so do not look back and forth through the items. Do not try to remember how you

checked similar words earlier in the test. Make each word a separate test. Work as quickly as you can. Do not worry over single scales. We want your "first ideas or feelings" about these reading words. Please do not be careless because we want your true feelings.

If you have any questions ask them now.

The following examples are for you to practice on. Your teacher will check to see that you are proceeding correctly.

The "key word" is SUN.

SUN

Bad				Good		
_____:	_____:	_____:	_____:	_____:	_____:	_____:
-3	-2	-1	0	+1	+2	+3

Hot				Cold		
_____:	_____:	_____:	_____:	_____:	_____:	_____:
+3	+2	+1	0	-1	-2	-3

Far				Near		
_____:	_____:	_____:	_____:	_____:	_____:	_____:
-3	-2	-1	0	+1	+2	+3

Small				Large		
_____:	_____:	_____:	_____:	_____:	_____:	_____:
-3	-2	-1	0	+1	+2	+3

You will notice that 3 special answer sheets have been given to you. Please use them in this way: When you have placed a check-mark on the right space on the question sheet go directly to the answer sheet and fill in the same space there. Be sure that you fill in the space that has the same number as the one on the question sheet and is on the same side of the "o" as in the question sheet. Make sure you do the scales one by one and that you fill in the spaces according to the directions at the top of the sheet.

You will notice a space between numbers 1 and 2 on the right side of the zero. Just pretend that space is not there. When you have finished the twenty scales for one word, go to the twenty scales below for the next word and then over to the top of the sheet and so on. Use the sheets as numbered.
PLEASE DO NOT BEND OR TEAR THESE SHEETS.

Fill in only your name and the name of the test at the top of each answer sheet.

APPENDIX E

FACTOR LOADINGS AND COMMUNALITIES

SUMMATION ACROSS CONCEPTS

APPENDIX E

ROTATED LOADINGS AND COMMUNALITIES OF THE 20 TEST SCALES - SUMMATION ACROSS CONCEPTS

SOCIAL STUDIES

SCALE	h ²	FACTORS				
		I	II	III	IV	V
clean - dirty	.565	.666	.262	-.227	.036	.009
painful - pleasurable	.631	.780	-.043	-.083	.109	-.050
soft - hard	.521	-.439	-.074	.541	.169	.030
light - heavy	.534	-.202	-.144	.686	-.049	-.015
rough - smooth	.540	-.494	-.026	.533	-.076	-.076
moving - still	.497	-.061	.661	-.091	-.022	.217
strong - weak	.537	.222	.612	.315	.117	.016
fast - slow	.545	-.075	.716	-.036	.144	.069
important - not important	.450	.514	.164	.344	.198	.034
kind - cruel	.684	.814	.079	-.089	.039	-.081
excitable - calm	.338	.058	-.147	-.009	.247	-.502
large - small	.368	.152	.232	.536	.024	.053
dangerous - safe	.576	.692	-.172	-.128	.198	-.112
bad - good	.694	.812	.029	.026	.181	-.013
steady - changing	.721	.027	.042	-.038	-.072	-.843
unusual - usual	.635	.159	.039	-.035	.778	.042
ugly - beautiful	.567	.751	-.019	-.014	.046	-.011
hot - cold	.419	.101	.573	.104	-.107	-.241
complex - simple	.319	-.033	.261	.412	-.283	.028
uncertain - certain	.539	.277	.128	.017	.623	-.240
Percent of Total Variance	53.401	21.784	9.885	9.145	6.752	5.835

APPENDIX E

ROTATED LOADINGS AND COMMUNALITIES OF THE 20 TEST SCALES - SUMMATION ACROSS CONCEPTS

LITERATURE

SCALE	h ²	FACTORS				
		I	II	III	IV	V
clean - dirty	.555	.556	-.440	.206	.095	.000
painful - pleasurable	.612	.754	-.144	-.080	.114	.050
soft - hard	.512	-.319	.631	-.011	.090	.069
light - heavy	.527	-.054	.715	-.025	-.064	.089
rough - smooth	.505	-.334	.617	.051	-.037	-.088
moving - still	.560	-.061	-.061	.716	-.086	.181
strong - weak	.549	.204	.141	.669	.077	-.183
fast - slow	.551	-.063	-.067	.734	-.031	-.060
important - not important	.465	.591	.103	.169	.050	-.272
kind - cruel	.660	.761	-.265	.062	.046	-.071
excitable - calm	.279	.114	.087	-.150	.455	-.170
large - small	.440	.226	.316	.205	-.156	-.472
dangerous - safe	.568	.696	-.170	-.113	.185	.083
bad - good	.677	.793	-.143	.023	.161	-.035
steady - changing	.780	-.096	-.278	-.059	.139	-.819
unusual - usual	.376	.316	.015	.158	.500	-.019
ugly - beautiful	.534	.709	-.083	-.018	.158	-.003
hot - cold	.302	.020	.025	.358	-.409	-.077
complex - simple	.542	-.022	.303	.119	-.629	-.197
uncertain - certain	.483	.326	.024	.176	.579	-.095
Percentage of Total Variance	52.382	19.845	9.740	9.318	7.698	5.780

APPENDIX F

FACTOR LOADINGS AND COMMUNALITIES

THE CONCEPT "YOURSELF"

APPENDIX F

ROTATED LOADINGS AND COMMUNALITIES OF THE 20 TEST SCALES - CONCEPT "YOURSELF"

SOCIAL STUDIES

SCALE	h^2	FACTORS						
		I	II	III	IV	V	VI	VII
clean - dirty	.495	.574	-.284	-.081	.088	-.136	.230	-.021
painful - pleasurable	.676	.716	.014	.069	.300	.181	.187	.027
soft - hard	.712	-.207	.017	.206	-.788	-.061	.014	.029
light - heavy	.671	-.197	-.122	.766	-.116	.011	.067	.113
rough - smooth	.576	-.288	.091	-.059	-.550	.068	.403	-.110
moving - still	.688	.162	-.162	-.003	-.052	-.793	.036	.059
strong - weak	.733	.086	-.832	.106	-.002	-.036	.067	-.127
fast - slow	.664	.178	-.731	.048	.127	-.227	-.116	.121
important - not important	.496	.523	-.326	.122	-.225	.013	.207	.083
kind - cruel	.578	.625	-.356	-.049	.174	-.163	.014	-.021
excitable - calm	.558	-.214	.027	.043	.044	.139	-.698	-.032
large - small	.708	.169	-.031	.815	-.022	.012	-.115	.008
dangerous - safe	.582	.637	.261	.001	.058	-.212	-.145	-.197
bad - good	.627	.738	-.067	-.098	.140	.063	-.207	-.036
steady - changing	.666	.245	-.030	-.194	-.408	.169	-.322	.518
unusual - usual	.603	.427	-.274	.207	-.031	.324	-.191	-.401
ugly - beautiful	.462	.541	-.251	.032	-.008	-.274	-.066	.160
hot - cold	.515	.136	-.493	.041	-.113	.413	-.082	.250
complex - simple	.682	-.081	-.064	.203	.074	-.042	.113	.781
uncertain - certain	.593	.368	-.114	.016	.101	-.355	-.536	-.142
Percentage of Total Variance	61.427	17.288	10.314	7.374	6.782	6.714	6.668	6.286

APPENDIX F

ROTATED LOADINGS AND COMMUNALITIES OF THE 20 TEST SCALES - CONCEPT "YOURSELF"

LITERATURE

SCALE	h^2	I	II	FACTORS III	IV	V	VI
clean - dirty	.595	-.335	-.363	.088	-.122	-.057	-.570
painful - pleasurable	.388	-.519	.176	.142	-.162	-.200	-.037
soft - hard	.541	.572	.174	.194	-.001	-.244	.293
light - heavy	.460	-.076	.006	.536	.393	.113	-.005
rough - smooth	.632	.011	.018	.040	.778	-.148	.061
moving - still	.573	-.023	.502	.452	.143	.165	-.261
strong - weak	.650	-.192	-.766	-.097	-.050	-.087	-.080
fast - slow	.667	-.037	-.781	.151	-.125	.022	.130
important - not important	.558	-.707	-.147	.067	.088	-.013	.155
kind - cruel	.535	-.492	-.318	.148	-.292	.246	-.153
excitable - calm	.579	-.022	-.287	.087	.148	-.676	-.099
large - small	.491	-.197	-.095	-.137	-.012	.152	.633
dangerous - safe	.614	-.308	-.061	.469	-.487	-.162	-.176
bad - good	.560	-.531	-.057	.295	-.347	.092	-.241
steady - changing	.562	-.016	.054	-.703	.115	-.017	.226
unusual - usual	.424	-.228	-.104	.473	-.162	-.254	.218
ugly - beautiful	.495	-.682	-.089	.010	.037	-.091	.111
hot - cold	.640	.020	-.370	.163	.147	.658	.151
complex - simple	.517	.069	.143	-.116	.520	.355	-.285
uncertain - certain	.571	-.517	-.053	.441	-.088	-.030	.312
Percentage of Total Variance	55.270	13.521	10.231	9.511	8.266	6.905	6.837

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